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A Magazine of Practical Surgery in All its Branches

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No. 2.

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AMERICAN
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VOL. XXVIII. MAY, 1914. No. 5

THE INSUFFICIENCY OF THE ILEOCECAL VALVE IN THE X-RAY PHOTOGRAPH.

DR. ERNST MARCUSE,
BERLIN, GERMANY.

There are two methods of examining the intestines by the *x*-rays. The first is the filling per os by the Rieder contrast meal, consisting of 350 grammes of gruel and 50 grammes of carbonate (not nitrite) of bismuth or 75 grains of sulphate of barium. It is necessary to get a pure preparation of the barium, as there have been fatal intoxications from soluble salts of barium. Such accidents can be avoided by prescribing barium sulphate purissimum for *x*-ray purposes. If the stomach and the small intestines are normal, they will both be emptied six hours after such a contrast meal, and the whole bismuth shadows will be found in the colon ascendens, and by further examinations, after 9, 12, 24 hours, one will be able to examine gradually the whole colon. But if there is a stricture in the stomach or in the small intestine, bismuth ingesta will be found even after a longer period in the jejunum or ileum. Not every retention after six hours, however, is due to a stricture of the small intestine. For *Schwarz*[1] found out that in cases of enteroptosis there are often, after 9 or 10 hours, still some bismuth shadows in the lowest loops of the ileum. *Groedel*[2] directed our attention to another group of cases that show the same retention in the lower parts of the small intestine, and these, too, where there is no stricture of the intestine, as it is easy to find out by the second standard method of examining the intestine by the aid of the *x*-rays: the contrast enema. It consists of an emulsion of 150-200 grammes of sulphate of barium, 300 grammes of bolus alba, and lukewarm water to the total amount of one liter of liquid. Such an enema, injected under a pressure of not more than half a meter of height, will in normal cases fill the whole colon up to the cecum. But there are cases in which this contrast enema, as the *x*-ray plate will demonstrate, penetrates through the ileocecal valve into the lower loops of the ileum. This symptom of insufficiency of the valve is, as *Groedel* has shown, often connected with a retention of the contrast meal in the ileum, and he supposes that this is caused by the flowing back of the cecal contents into the ileum during digestion. As he observed this insufficiency of the valve in cases of chronic appendicitis, he suggested a causal connection between the appendicitis and the dehiscence of the valve, and he believes that the inflammatory swelling of the cecal mucosa and the adhesions occurring in most of the cases call forth the insufficiency of the valve. The pains of which his patients complained are to his idea caused by the irritation of the small intestine through their abnormal contents.

Dietlen[3] was the first who denied that this insufficiency of the valve was a typical pathological symptom; he found it, it is true, in a certain number of cases associated with chronic appendicitis, but also in other cases where there was no affection of the appendix, but other pathological changes in some other part of the colon or its neighborhood. He observed this insufficiency of the valve in cases of spastic obstipation, of obstipation of the so-called ascendens typus, pericolitic, and pericholecystitic adhesions and even in a case of hydrops of the gall bladder and of spondylitic abscess. *Lohfeldt*,[4] too, who observed the symptoms in two cases of perityphlitis, does not consider it as a sign of any diagnostic value.

I myself have observed this insufficiency of the ileocecal in eight cases; in only three of which there was an inflammation of the appendix.

CASE I. Mr. B., over 60 years old, fell suddenly sick with heavy pains in his right side; there was a slight irritation of the peritoneum with a distinct meteorism and a muscular spasm over the ileocecal fossa, but no fever. On account of his age, no immediate operation was performed, and he slowly recovered, but the meteorism was still noticeable, especially in the right side of the abdomen. The *x*-ray examination showed that six hours after the contrast meal the small intestine was already empty, but that there was insufficiency of the valve.

CASE II. Mr. F. suffered for some weeks from pains in the ileocecal region. There was continuous resistance in the ileocecal fossa, and McBurney's point was sensitive even to a slight touch. In this case, too, the *x*-ray observation showed that the contrast enema ascended into the smaller intestine. There was no operation.

CASE III. Mrs. P. suffered for two months from pains in her right side and there were all the signs of a chronic appendicitis. Six hours after the contrast meal I found ample residues in the small intestines and when an enema (one liter of liquid) was administered, she complained of having pains in her abdomen. On the *x*-ray plate, some of the lower loops of the small intestine were filled with the bismuth enema. The patient was operated upon and we found adhesions fixing the base of the appendix to the cecum and the tip to the side walls of the pelvis.

This condition seems to me to be a complete explanation for the insufficiency of the valve. The appendix fixed through adhesions to the side wall of the pelvis is always pulling on the lower parts of the cecum and may in that way cause the dehiscence of the valve. But the pains of which the patient complained during the injection were certainly not due to the flowing back of the enema into the ileum, as Groedel supposes, for in my case I could observe the filling of the small intestine long before the patient complained of pains. In some other cases, which showed the same dehiscence of the valve, there were no pains during the injection of the enema, and some of my patients, who certainly had a normal ileocecal valve, suffered pains during the enema. I perfectly agree with Dietlen that the pains are due to the pulling of the adhesions in the neighborhood of the cecum.

In these three cases I am convinced that the appendicitis is responsible for the insufficiency of the ileocecal valve. But in the five other cases there were no signs of perityphlitis at all, though in the next one there might have been pericolitic adhesions.

CASE IV. Mrs. G., 68 years old, had suffered for some years from attacks of pains in the right side of the abdomen, with signs of intestinal obstruction. She never had any symptoms suspicious of appendicitis. Considering her good general condition, the long duration of her disease, and the lack of any other intestinal trouble in her record that might have produced a stricture, the probable diagnosis was ileus caused by pericolitic adhesions. The *x*-ray examination showed no abnormal function of the bowels, save the insufficiency of the ileocecal valve.

In the next two cases the appendix had previously been removed.

CASE V. Miss C., a girl of 18 years, with all signs of neuropathic constitution, had been operated upon half a year before for chronic appendicitis. The appendix contained two fecal stones and was fixed to the cecum by numerous adhesions. The stump of the appendix was buried and the mesenteriolum was sutured in such a way as to cover it also with normal peritoneum. Four months after the operation she began to complain of attacks of colics in the abdomen. The *x*-ray examination showed remnants of bismuth chyme in the small intestine six hours after the meal and revealed also insufficiency of the valve. A thorough examination under narcosis disclosed the existence of a tumor of the genitals, and a dermoid cyst of the left ovary as big as an apple was removed; but unfortunately we forgot to look after the ileocecal region and see if there were any adhesions.

CASE VI. Mrs. R. had been operated upon four years before for purulent peritonitis and gangrenous appendicitis. One year later there was another operation for hernia of the abdominal wall, during which we found numerous adhesions between the bowels. Since then she had suffered from attacks of ileus, occurring once or twice a year and during which I always observed in the region of the flexura coli dextra an enormously dilated intestinal loop. Those attacks have until now always passed away under conservative treatment. After the last attack, however, I made an *x*-ray examination, hoping to find the seat of the supposed obstruction in order to have the necessary information if an operation proved necessary. But I could find nothing abnormal in the position or the function of the intestine, except the insufficiency of the valve.

I think we have a right in this case to suppose that there is a band in the neighborhood of the flexura hepatica, due to the previous peritonitis, which, under certain unknown circumstances, produces the intestinal obstruction. During such attacks, the colon ascendens is dilated, as we are able to observe, so that the valve becomes insufficient. *Genersich*[5] has observed that by gradually dilating the large intestine we can artificially produce the dehiscence of the valve and he used for therapeutic purposes enemas of 6-9 liters of liquid in order to clean even the higher loops of the small intestine. I think the same dilatation of the cecum and dehiscence of the valve will easily occur in cases of obstruction in the lower parts of the colon. A similar condition may have existed in the last two cases.

CASE VII. Mrs. H. suffers slightly from constipation and she frequently observed traces of mucus in her feces, but she has no enteritis muco-membranacea. She complained of pains in the right side of her abdomen, which her family physician

thought were caused by cholecystitis, but it was not possible to get a clear idea of her condition. The *x*-ray examination showed that there was a considerable ptosis of the stomach and of the large intestine, so that the colon transversum formed very acute angles with the rest of the colon, but as far as I could judge there were no adhesions on these angulations. Ten hours after the contrast meal I still found bismuth chyme in the lower parts of the ileum and by an enema of one liter of liquid I could easily fill many of the lower loops of the small intestine.

Groedel would perhaps in this case accuse the catarrhal swelling of the mucosa of the colon of the dehiscence of the valve. But I cannot agree with that argument. To my thinking a swollen valve ought to shut easier and earlier than a normal one. I rather suppose that the sharp angulations at the hepatic and splenic flexures may at certain moments form an obstruction to the passage of the feces and produce a dilatation of the different loops and in that way the insufficiency of the valve. The same mechanism may prevail in the cases of chronic obstipation observed by Dietlen, and also in the last case that showed a gross impediment to the passage of the feces in the form of a cancer of the colon.

CASE VIII. Mrs. H. suffers from a cancer of the colon descendens, which quite to my astonishment was not to be demonstrated on the *x*-ray plate, but I found a very pronounced insufficiency of the valve. The operation explained to me why the *x*-ray this time had deceived me; the cancer was ulcerated and did not constrict the lumen of the colon; the big tumor that I had felt through the abdominal wall was a metatstasis in the mesocolon. But earlier there must have been a stricture of the colon, for the patient had suffered from very obstinate constipation, alternating with diarrhea, and during that period there must have been a dilatation of the colon ascendens that finally caused the insufficiency of the valve.

Of course, it would be very easy to maintain that in all those cases there were chronic perityphlitic inflammations, not to be discovered by the clinical examination. It is true, we often find in a patient on whom we operate in what we believe is his first attack of appendicitis very grievous alterations due to former inflammations, that certainly occurred without any manifestation. Further investigation is therefore indicated. It is particularly important that whenever a patient is operated upon, who had shown evidences of insufficiency of the ileocecal valve, the region of the cecum should be examined and the presence or absence of adhesions be determined. But as I have in my cases always found pathological alterations that explain the mechanism of the dehiscence, I would much rather consider those abnormal conditions to be the reason of the dehiscence. There is no doubt that even a very slight cause may bring about the insufficiency; *Schwarz*[6] has observed that a superficial massage may overcome the resistence of the valve and produce the reflux of the contents of the colon in the small intestine. *Singer* and *Holzknecht*[7] observed the insufficiency of the valve in cases of spasm of the colon, and they suppose that it is due to the increase of intestinal pressure during the spasm, a mechanism similar to that which I assume for some of my cases. The most serious causes and the slightest changes may thus make the valve insufficient; *Katsch*[8] even observed the symptom in healthy persons, who did not suffer from abdominal troubles at all, and a similar observation is related by Dietlen.

We therefore have no right to argue that the insufficiency of the ileocecal valve is a sign of perityphlitis, as Groedel supposed. I do not even agree with Lohfeldt that pains during the administration of the contrast enema occurring in patients with this symptom are a sure sign of adhesions due to appendicitis. I think that Dietlen's and my cases demonstrate with perfect evidence that the most varied pathological alterations in the whole colon and even in the neighboring tissues may under certain circumstances produce the insufficiency of the valve. And if it is proven that even perfectly healthy people may show the same symptoms, I think I have made clear that the insufficiency of the cecal valve is a symptom that cannot claim any pathognomonic value—one that we may register as a curiosity, but that does not permit any diagnostic conclusions.

[1]Schwarz: Die Erkennung der tieferen Dünndarmstenose mittels des Röntgen verfahrens wiener Klinische Wochenschrift, 1911, No. 40.

[2]Groedel: Die Insufficienz der valvular ileocecalis im Röntgenbild. Fortschritte auf dem Gebiet der Roentgenstrahlen. Bd. XX, Heft 2.

[3]Dietlen: Die Insufficienz der Valvular ileocecalis im Röntgenbild. Fortschritte auf dem Gebiet der Röntgenstrahlen, XXI, 1.

[4]Lohfeldt: Über Insufficienz der Valvular Bauhini und ihr Verhalten unter dem Leuchtschrein. Aerztlicher Verein, Hamburg 4. XI, 1913, Autoreferat, Münch. Mediz. Wochenschrift, 1913/49.

[5]Genersich: Le lavage du canal digestif. Progrès. Médical, XXI, 38.

[6]Schwarz: Die Röntgendurchleuchtung des Dickdarms während des Einlaufs als Hilfsmittel zur Diagnose stenosierender Bildungen. Wiener Klinische Wochenschrift, 1912-16.

[7]Singer und Holzknecht: Die objectwen Symtome des chronischen Colonspasmus. Deutsche Medizinische Wochenschrift, 1912-23.

[8]Katsch: Discussion to the Lecture of Lohfeldt. Arztl. Verein, Hamburg, 4, XI, 1913, related Münchner Med. Wochenschrift, 1913, No. 49.

In hydrocele and other scrotal operations a transverse incision, preferably in one of the skin folds, produces a far better cosmetic result than the vertical incision generally employed.

EVIL RESULTS OF COLLES' AND POTT'S FRACTURES, AND HOW TO AVOID THEM.

R. HERTZBERG, M.D.,
Surgeon to Stamford Hospital,
STAMFORD, CONN.

The reduction of a fracture is an operation that every physician is, at some time or other, called upon to perform. Upon the physician's ability to properly recognize the condition he is dealing with and upon the employment of the proper method of reduction and the maintenance of that reduction, depend the ultimate results. Directly proportionate to the degree of luxation of fragments and their proximity to joints are the loss of function and the deformity. A fracture of a long bone near a joint is more difficult of reduction and retention than when the fracture is near its middle; for one of the levers is necessarily unstable and difficult to hold in place.

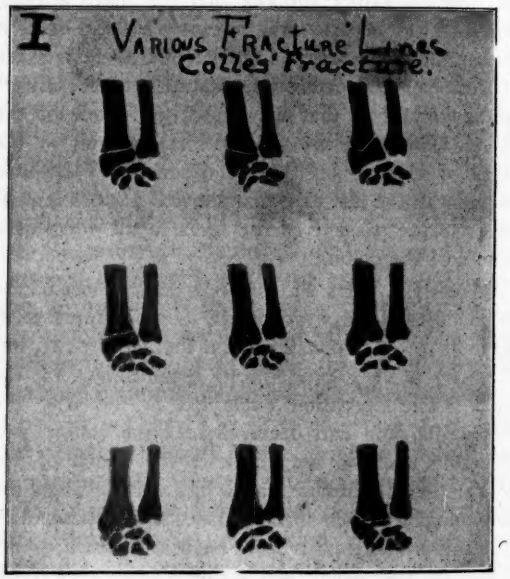
To obtain uniformly good results, three things are necessary:

First, a positive and proper appreciation of the condition one is called upon to deal with—and by this I do not mean that it is sufficient when we see a silver-fork deformity to say that we are dealing with a Colles' fracture. It is necessary to make a most accurate diagnosis of associated lesions present; and there is but one way to do this: X-ray your fractures; in most cases a fluoroscopic examination is perfectly satisfactory for making a correct diagnosis, or confirming one previously made. If this is impossible to obtain at the time of the accident, it should be done as soon as possible thereafter; and it will be a revelation how many times a supposedly proper reduction will be found faulty, and how many times unsuspected additional lesions will be found. The fluoroscope should be supplemented by a radiograph.

Secondly, do not attempt reduction of a fracture about a joint (or for that matter, any fracture) except under an anesthetic; it saves lots of hard work on your part and pain and suffering to your patient. Moreover, in many a fracture easy coaptation is obtained under an anesthetic which it has seemed impossible to obtain with the conscious patient.

Next, and most important, is the proper retention of the reduced fracture, and this is most effectually done if the mechanical principles involved in a fracture are clearly understood. The lines of force producing the fracture are often productive of other lines of force which resist reduction and re-establish the luxation; if a proper understanding of the lines of direction is not had, and the counterbalance employed. Compare carefully the injured part with the opposite uninjured part of your own normal member. Location of bony prominences in relation to each other must be carefully considered; length of limb and often circumferential measurements will add valuable data toward a diagnosis. Inability to make certain motions or abnormal motion about a joint is conclusive of serious disturbance. Crepitus is of course proof of the solution of continuity of bone, as it is produced by the rubbing of the broken ends upon one another.

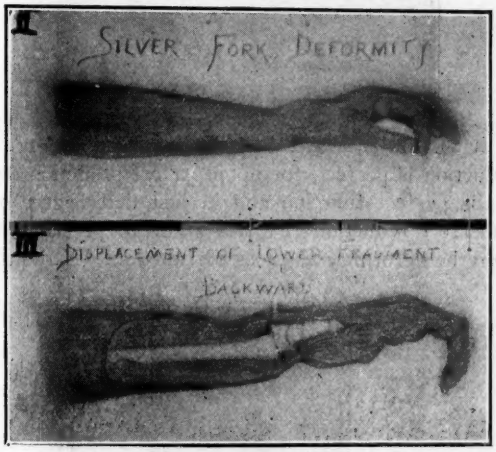
But let me here give a warning. When called to examine a possible fracture, do not disregard all the physical signs present and begin to hunt for crepitus. Many a poor functional result has been produced by this rough forward and backward, in-



ward and outward bending and pulling. It is, of course, gratifying to have the spectators hear the grating of bone upon bone, but the motor or sensory nerve that is perhaps torn or injured, and the lacerated and stiffened tendons will not be half so much appreciated by the patient who has lost function or sensation as a result of the doctor's diligence or enthusiasm. Much needless strength is expended in the reduction of fractures and dislocations on the part of the doctor, which results only in ultimate discredit to him and in harm to the patient. Be sure of your normal surface anatomy and the distorted relations will speak a language understood at a glance. If there are not sufficient signs that can be elicited without the danger of adding injury to the part, put on a temporary splint and get the member between a Crooks tube and a fluoroscope

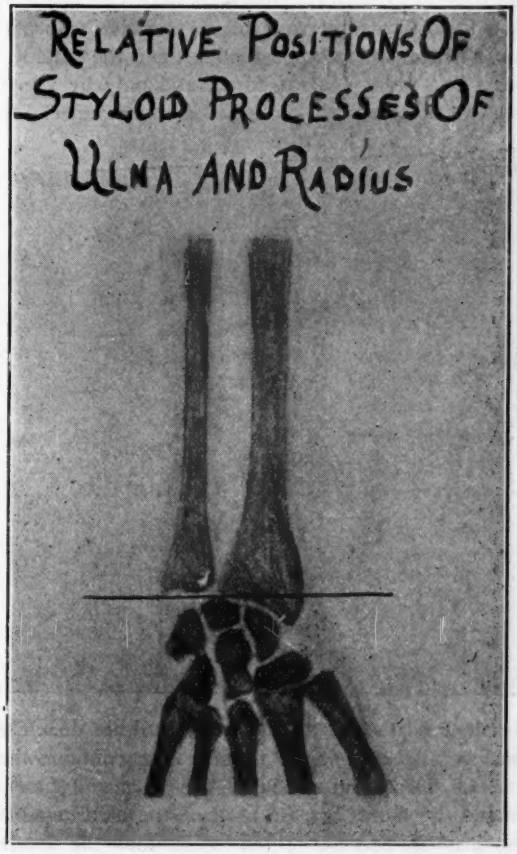
or have two plates taken at right angles to each other where possible, as a permanent record. Then, when sure, go ahead, slowly and gently; brute force is seldom required and can only increase what is already serious injury.

The commonest fracture, which often leaves the patient with a crippled limb, is that of Colles. This is a fracture across the lower end of the radius with a backward and outward luxation of the hand. The styloid process of the ulna may or may not be fractured. The fracture line is usually from ¾ to 1¼ inches above the tip of the styloid process of the radius transversely across the bone, and may vary as shown in figure 1. The deformity produced by this fracture is in direct proportion to the amount of luxation. The dorsal displacement of the lower fragment causes an elevation on the back of the arm just above the wrist and a corresponding depression on the palmar surface (fig. 2), and



besides this, an undue prominence of the styloid process of the ulna and a disturbed relation between it and that of the radius. Normally, the styloid process of the radius is half an inch lower than that of the ulna (fig. 4). The ulna becomes unduly prominent because the hand, plus the lower fragment, is carried outward and upward, and the radial styloid process ascends with it to or even higher than the level of that of the ulna. This lateral outward and upward displacement is sometimes so pronounced as to cause the so-called bayonet deformity (fig. 5), and in these cases is usually accompanied by a tearing of the internal lateral ligament, with or without a fracture of the ulna styloid. A majority of these fractures are complicated by an impaction of the lower fragment against the posterior lip of the upper fragment (fig. 8), the extent varying with the force producing the fracture and the direction of the lines of force.

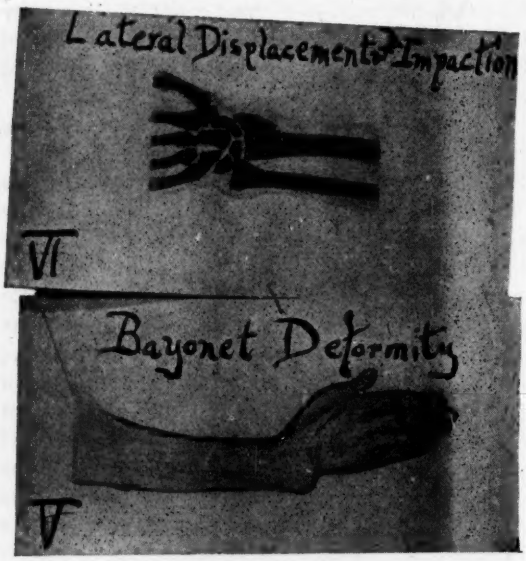
This fracture is generally produced by a fall on the palm of the extended hand. The carpus acting as a solid body is pushed against the posterior lip of the articular surface of the radius, putting the anterior wrist ligaments on the stretch. As this ligament is more resistant than the bone, the hyperextension is transmitted to the radius and it fractures higher or lower, depending upon the point where the driving force from below and the lever action of the radius meet. The fall upon the palm suddenly fixes the carpus against the articular surface of the radius in full extension; the lever ac-



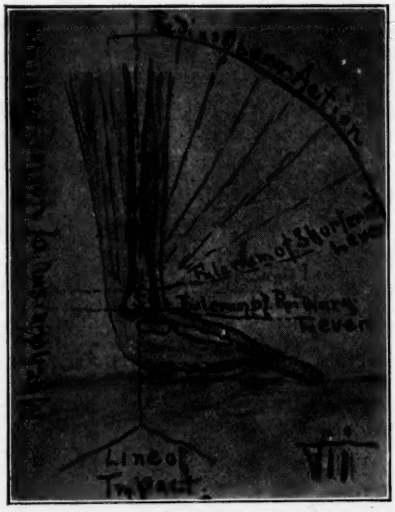
tion of the radius is continued to increase this extension; both forces meeting at the joint, the strong anterior ligament is capable of resisting this pull and the bone breaks just at or above its attachment (fig. 7). The fracture may also be produced by a fall upon the dorsum of the hand when, the forces working in the opposite direction, the displacement is, of course, on the palmar surface. In children it is not rare to find an epiphyseal separation either alone or associated with a fracture line running into the radius. After eighteen years epiphyseal separation alone does not occur.

The evil after-results of this injury are directly due to the degree of un-reduction that is allowed to remain. The fracture produces a wrist increased in all its dimensions with a consequent tension of tendons and ligaments. Add to this the laceration of tendons and sheaths, the tangents at the site of fracture over which they must now ride and the formation of callus both in front and behind, and it is small wonder that deformity and loss of function is the result unless proper reduction is made (fig. 8).

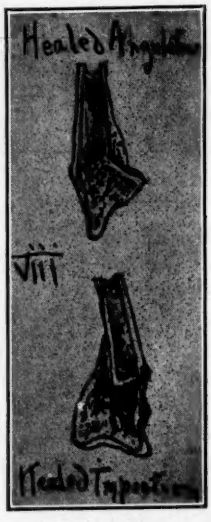
Do not attempt to pull this fracture into place; you may get the lower fragment down if not impacted too hard, but you will not be able to bring it into proper lateral apposition without the employment of a great deal of force, and only by sheer luck can you properly reduce it in this manner. A



simple and always effective way, one that does the least possible damage to tissues, is to continue the lines of force that produced the fracture. Over-extend the hand; lay the back of the hand against the arm if necessary; remember that the *lower fragments is attached to the hand and moved with it,* and if the hand is extended back until the slack of the anterior ligament is taken up, then the lower fragment follows the hand, and the impaction is freed. While the hand is in this over-extended position, usually at a little more than right angles to the arm, the lateral displacement is corrected by pushing the hand to the ulnar side. This is usually accomplished with but little necessity for force. When the hand is in relatively normal lateral position, push against the lower fragment, keeping the hand over-extended, until the posterior lips of both upper and lower fragment are in contact, then sharply flex the hand and the fracture is reduced (fig. 9). Once reduced, if the hand is kept flexed it will not easily become re-dislocated. Examine now with the fluoroscope and note the apposition;



if it is not accurate, repeat the procedure until reduction is perfect, for upon perfect reduction depends perfect function and in just that degree of imperfect reduction that we allow to persist will there be deformity and loss of function. If the tip

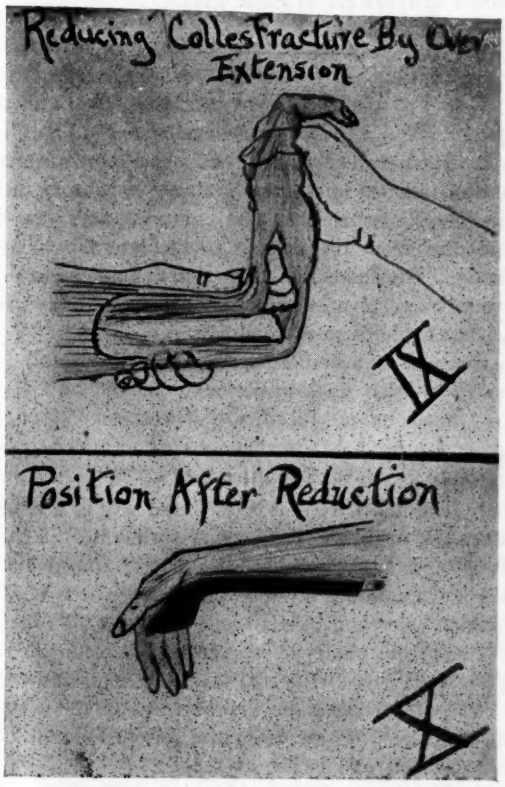


of the styloid process of the ulna is fractured it is easily held in place by a strip of adhesive plaster.

Any splint that holds the hand in a position of flexion will give good results. The important thing is to keep the hand flexed; this locks the lower fragment tightly in position and a disturbance of

position is almost impossible. Anterior and posterior splints from the elbow to the wrist, with the hand flexed by bandaging, or the hand on Shede's anterior splint, with or without a posterior splint, makes an excellent retentive apparatus (fig. 10). From three to four weeks is usually sufficient immobilization, depending somewhat on the age of the patient. Passive motion may be begun at from two-and-a-half to three weeks. If reduction has been accurate, the result will be nearly perfect, functionally and anatomically.

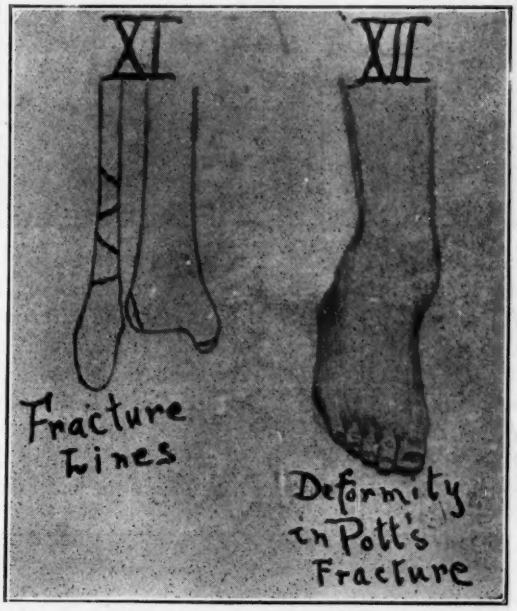
The prototype of the Colles' fracture, in the leg, and one which often gives a great deal of trouble,



is Pott's fracture of the fibula. By this we mean a fracture of the fibula anywhere across its lower third. It may be just above the external malleolus (fig. 11). This fibular fracture may or may not be accompanied by a fracture of the tip of the internal malleolus and a corner of the external lower edge of the tibia, but usually the fibula is fractured alone with a tearing from the bone of the internal lateral ligament. This fracture is rare in children, but frequent in adults. It is generally produced by twisting the foot on uneven ground, or by falling sideways when the foot is fixed, as between gratings, rocks, in a hole, or anything that will hold it, or by falling or jumping forcibly on the foot while it is inverted or everted.

If while the foot is fixed the body falls to the tibial side, or is twisted inward by misstep or jumping, the tibio-fibular and external lateral ligaments are put on the stretch, and the ligament, being stronger than the bone, tears the external malleolus off, above its point of insertion. If the force is continued in the same direction the astragalus is crowded against the internal malleolus and breaks it partly or completely off. This is fracture by inversion (fig. 15).

If the foot be fixed and the body fall outward, the internal lateral ligament is put on the stretch; it sometimes tears but more often pulls a piece off of the internal malleolus; the force continuing,



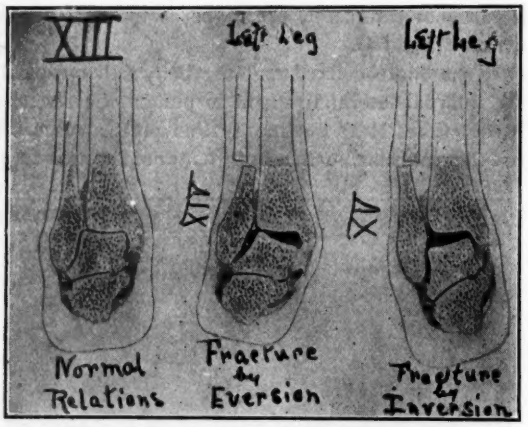
drives the astragalus and calcaneum against the external malleolus, and the weight of the body forces the leg and the shaft of the fibula inward. The entire weight of the body comes to rest on the fibula as it impinges against the astragalus and it breaks at some point in its lower third. This is fracture by eversion (fig. 14).

Thus, either by inversion or by eversion, may this fracture be produced. The tendo Achilles pulls the heel up and the foot back with more or less rotation. Proportionate upon the ligamentous tearing is the degree of luxation of the foot both backward and outward; it may be hardly noticeable or the foot may be markedly dislocated outward, as shown in figure 12.

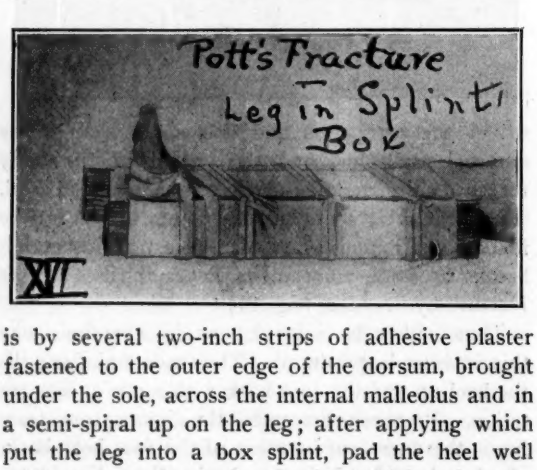
If proper reduction is made or the patient is

allowed to walk on the foot before body union is well established, the astragalus crowds the external malleolus outward and the foot is everted, and the patient walks on the inner edge of his foot or in a position of talipes valgus.

In contrast to Colles' fracture, which is difficult to reduce, but once reduced easily held in place, Pott's fracture is easily reduced, but hard to hold in reduction. To reduce, invert the foot strongly,



pushing the astragalus against the styloid process of the tibia, then strongly flex the foot, pulling it forward. In this position of flexion and inversion it must be maintained, or evil results, such as spreading of the mortise between the fibula and tibia, with consequent eversion and backward dislocation, are sure to result. Many methods have been tried and all of them are found wanting at some time. An effectual fixation of the inversion



is by several two-inch strips of adhesive plaster fastened to the outer edge of the dorsum, brought under the sole, across the internal malleolus and in a semi-spiral up on the leg; after applying which put the leg into a box splint, pad the heel well with a cotton ring pad and raise it higher than the calf, so that the leg may be crowded against the bottom of the box by placing wads of cotton on it, or better, by adhesive straps across the leg and down on each side passing through the bottom of the box by means of slits (fig. 16). This fixes the leg in both desired positions: the spiral fixes the inversion, and the raised heel and depressed calf fixes the flexion, all of course to be reinforced by packing and bandaging. This limb may be kept here until union has taken place or until the bones are fixed, and then put into plaster. It is extremely difficult to put this fracture up in plaster and maintain the proper relations, and it is best not to try it until some union in the proper position has taken place. If the fracture is reduced in this manner and the positions of inversion and flexion are maintained, a uniformly good functional result is obtained in from six to eight weeks.

40 SOUTH STREET.

A NOTE ON NASAL SYNECHIAE.*

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A nasal synechia is an adhesion between two parts of the nasal cavity. It may be fibrous, cartilaginous, or of a bony nature, and usually stretches from the septum to the lateral wall, although synechiae are sometimes found running from one turbinate to another. The size may vary from a hair line to a broad band.

Synechia can be classified as:

1. Non-fibrous.
2. Fibrous.
3. Cartilaginous.
4. Bony.

1. The non-fibrous type is found within a month after the operation causing its formation. It consists of a slight amount of young connective tissue and a number of small bloodvessels. It is of a pinkish color and bleeds easily.

2. The fibrous type is merely the result of the growth of scar tissue and is found at a longer interval after operation than type 1. It does not bleed as readily, owing to the lessened number of bloodvessels and is not as red.

3. The cartilaginous variety is usually congenital, especially if found in the young. A probe examination will distinguish between this and type 4.

4. The bony type is similar to the cartilaginous, differing only in composition.

A previous operation is generally the cause of synechia formation, but ulcerative processes, such as syphilis lupus, and nasal diphtheria, must be considered. The reaction to operative work, in the nose, whether with the galvano-cautery or from resection, is variable. Some cases form a false membrane, underneath which healing occurs and no synechiae form. Others have considerable post-

*Read at the Clinical Meeting of the Mt. Sinai Hospital Staff, Boston, Nov. 20, 1913.

operative swelling and granulation. This results in the apposition of two surfaces. The condition, then, that is necessary for synechia formation is the two raw surfaces, either in direct contact, or separated by such a narrow space that an attempt at healing by both sides causes the affected areas to touch. This type of adhesion is almost always fibrous and is most commonly seen between the middle turbinate and the septum. The bony variety is usually found farther back in the posterior nasal cavity.

Synechiae so frequently follow operative measures where the septal and the turbinal mucus membrane, opposite, have been injured, that the uttermost care should be taken, when operating on the turbinate, to protect the mucus membrane of the septum and vice-versa.

Small synechiae cause no trouble. With large adhesions the symptoms are those of nasal obstruction, headache, sneezing, coughing, asthma, inflammatory processes, and interference with the drainage of the nasal secretions.

The diagnosis can usually be made by rhinoscopic examination. In doubtful cases, the nasal tissues should be shrunk with an adrenalin and cocaine solution and a probe examination should be made.

Treatment should be undertaken only when the synechia causes symptoms, as the adhesions are often found when examining the nose for some other trouble. A more difficult problem than the permanent cure of the fibrous synechia hardly confronts the rhinologist. The adhesions, when cut, persistently reunite, and success is achieved, in most cases, only after a tedious and painstaking treatment.

Before 1894, cotton tampons and iodoformed gauze had been tried with unsatisfactory results. Then Schmidt substituted flat cardboard, but this soon becomes fetid and irritates the mucus membrane. In the same year, Dubuc employed celluloid plates, and, in 1895, Wright advised the use of gutta-percha, cut to the desired shape. In treating this condition by the interposition of a foreign body, the irritation, caused by the pressure, prevents healing. When the body is removed, healing takes place, but the synechiae reform.

In 1911, Brindel advised cauterization with chromic acid beads after a thorough separation of the synechiae. The application of the caustic was immediately followed by a nasal irrigation, made through the opposite nostril. After five or six days of non-treatment, the scab would fall off, leaving, as a rule, an indifferent result. Mauré uses mica scales, as thin as tissue paper. These can be sterilized and are elastic enough to allow the scale to be introduced through the nasal speculum while curled up. When placed in the desired position, in the nasal cavity, its own elasticity causes it to straighten. The mica is shaped before being placed in the nasal cavity. This method, according to the discoverer, has given good results. It has the advantage of thinness, allows the nasal secretions to flow freely, and is non-irritating. All these factors are important in producing a normal healing. Denker recommends the removal of the synechiae with part of the turbinate base. For after-treatment, he inserts celluloid or hard rubber plates between the septum and the turbinate. These are removed daily for fifteen to thirty minutes and replaced until healing occurs. However, the advantage he gains by this method, namely, space, can be obtained by a more conservative procedure, and one very easily carried out. After a complete cocainization of the turbinate, it can be fractured by exerting pressure with the long bladed Killian speculum. This gives more space between the turbinate and the septum and leaves an uninjured mucus membrane.

The use of the electrical current has given good results, but has the disadvantage of being tedious and requiring frequent sittings. The synechia is first cocainized, then the two needle electrodes, separated by a space of less than ¼ of an inch, are inserted about ¼ of an inch, at the junction of the synechia and the septal mucus membrane. A current of fifteen milliamperes is applied for ten minutes and then reversed so as to allow the easy withdrawal of the electrodes. This electrical current causes a necrosis of the tissues, but must be applied a number of times, at short intervals.

If the results by these methods are not satisfactory, the synechia can be cut at both attachments, great care being taken not to injure the mucus membrane at either end. Thus a comparatively large space separates the two stumps and a reformation of the synechia is not usual. A non-fibrous synechia will amost always recur, hence it is advisable to wait until it becomes fibrous before attempting operative treatment. If the turbinate base of the synechia is so large as to leave insufficient space in the nose, it may be advisable to prepare a turbinotomy. This should be done only after the fracture treatment has been tried and found to be unsuccessful.

When the synechia is cartilaginous or bony, Kyle uses a file saw that makes a V-shaped cut. This tends to draw the tissues away from one another. When using of the above described methods, it is very important to see the patient frequently until complete healing has occurred.

STRAIGHT DIRECT LARYNGOSCOPY, BRONCHOSCOPY AND ESOPHAGOSCOPY.

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BALTIMORE, MD.

(*Continued from April Number.*)

CHAPTER V.

Diseases of the larynx amenable to treatment through the direct laryngoscope. In taking up diseases of the larynx amenable to treatment, the writer has thought it more practical to give illustrative cases which have been selected from his clinical work. Acute laryngitis can nearly always be diagnosed with the mirror in adults. In a patient seen some months ago a low hanging epiglottis and a sensitive pharynx prevented a view of the larynx. After hypodermatic injection of morphine and atropine and the application to the pharynx and larynx of alypin (20% solution), the small laryngoscope was passed with the head straight. The entire larynx was much reddened and thickened. The vocal cords were swollen and looked like raw beef; the false cords met on phonation; the posterior wall stood out like a pouch. Only once before, in Krause's clinic in Berlin, had the writer seen such a picture and that patient was cured by persistent treatment. The writer's patient had a specific history so a probable diagnosis of acute laryngitis, engrafted on a chronic condition, was made. Under treatment the acute inflammation gradually cleared up so that in a month he could talk with a hoarse voice. Specific treatment seemed to have no effect. He is still being treated with nitrate of silver and continued improvement seems to indicate that the diagnosis was correct. In this case the writer was particularly impressed with the great value of direct laryngoscopy. One could not have seen the larynx satisfactorily with the mirror or the pharyngoscope and a diagnosis would have been guesswork without the aid of the direct laryngoscope. The method is worth learning, however expert one may be with the mirror, for cases like the above will occasionally be met with. In children acute laryngitis is quickly and easily diagnosed by direct laryngoscopy. DeZeng's portable battery or, in houses supplied with electricity, the controller may be used as the source of light. In all doubtful cases of acute laryngitis in children, the direct tube should be used to exclude more serious trouble. As seen through the tube acute inflammation usually presents more or less redness of the cords with absence of subglottic swelling, membrane or edema. In severe cases subglottic swelling, the so-called subglottis laryngitis or edema, may be found and, since the diagnosis is so easily made by examining the larynx with the head straight, it should never be neglected in suspicious cases. In the small larynges of children, slight swelling may result fatally. Through the use of the direct laryngoscope, prompt and efficient treatment can often be instituted and life saved. These cases in children present the strongest argument for all laryngologists to become expert in the use of the tubes.

Chronic laryngitis in adults can usually be diagnosed and treated with the mirror without recourse to the tube. Occasionally, however, the tissues may be greatly thickened so that more radical treatment than applications may be needed. About three years ago a lady, 23 years of age, was referred to the writer for hoarseness of some months duration. Examination with the mirror showed peculiar reddish thickenings on the posterior wall, the vocal cords posteriorly and in the anterior commissure. Two laryngologists had made a probable diagnosis of tubercular laryngitis. The patient had multiple neuro-fibromata of the skin and, thinking there might be some connection between the two conditions, the writer sent her to a dermatologist who reported that there could be no relationship. The patient went to her home in Virginia and two months later returned greatly distressed at the complete loss of her voice. In the larynx the thickenings seemed to have increased somewhat. Through the direct laryngoscope the diseased tissue was removed as well as possible and submitted to a pathologist who reported "chronic inflammation." After repeated applications of nitrate of silver had given no relief, the patient expressed a desire to consult a laryngologist in another city. He examined the larynx, sent her to dermatologists and had *x*-ray pictures made and finally characterized the condition as "fibrosis of the larynx," a condition similar to the skin tumors. He expressed the opinion that if she ever recovered her voice, it would be rough and unnatural and that she would have to be removed and that eventually a tracheotomy might have to be done. On the way home the patient spent a month with her sister in Cumberland, Md. At the end of that time she appeared in the writer's office talking with her natural voice and has since remained entirely well. The case

must have been one of chronic laryngitis and the removal of the tissue and subsequent rest of the voice probably resulted in cure. At any rate the patient was well and happy. It does not happen that one has to operate often for chronic laryngitis; but in those cases with great thickening causing marked hoarseness or aphonia, the writer does not hesitate to remove the diseased tissue through the direct laryngoscope. In pachydermia which is the worst form of chronic inflammation, the thickening on the posterior wall should be removed as often as may be necessary, and here again the direct method is the safest and quickest means of operating. In advocating this treatment, the writer will probably be opposed by some of the best authorities but it has always been his policy to remove any tissue in the larynx that interferes with phonation. It seems the rational thing to do; in other parts of the body a tumor or swelling that interferes with the function of an organ is promptly removed. And certainly we should pursue the same course to restore so important a function as the voice. The argument has been advanced that it is useless to remove pachydermia because it is so apt to return; the same argument could be advanced in papillomata of the larynx but the treatment advocated for them is frequent removal in adults or children. The writer feels that the high frequency spark might be advantageously used in the treatment of pachydermia. He intends to try it at the first opportunity.

Edematous laryngitis in adults can usually be scarified with the mirror unless edema is marked; oxygen can be used to advantage in these cases before, during and after scarification and may tide the patient over the dangerous period. In children the larynx can be scarified at the same time that the direct laryngoscope is used to make the diagnosis. If subglottis laryngitis is present, it is not amenable to treatment through the tube. The child should be examined repeatedly with the assistance of oxygen and at the first signs of closure, intubation or tracheotomy, preferably the latter, should be done.

Perichondritis can be diagnosed with the mirror; in those cases with abscess formation, the direct laryngoscope should be passed and part of the abscess wall punched away through it to insure good drainage. Diseased cartilage may be removed at the same time. This treatment applies to the epiglottis since abscesses of the thyroid and cricoid cartilages usually point externally and are opened through the skin. Some years ago a woman presented herself at the writer's clinic at the Presbyterian Hospital complaining of severe pain on swallowing. Her facial expression indicated that she was ill; her temperature on admission was 102 degrees. The mirror showed a large swelling involving the entire left side of the larynx. One could almost see the yellow reddish swelling fluctuate, and there was no doubt as to the diagnosis of abscess. The direct laryngoscope was passed after the use of cocaine and the abscess was opened with a long, straight knife. There was a gush of pus and relief was instantaneous. The patient was given cold, liquid diet and when she returned a few days later, healing was complete.

Membranous laryngitis. In the beginning of this disease a diagnosis can be quickly made by observation through the direct laryngoscope. After one has examined a few normal larynges, he will have no trouble in recognizing membrane through the tube. It is probably too much to say in the present stage of tube work that such an examination should be made in every case of beginning dyspnea in a child, but the procedure would add much to the attending physician's peace of mind. In making the examination the operator should be well protected as to mouth, nose and eyes. The writer generally uses a spectacle frame with very large glasses and an aluminum shield for mouth and nose attached to the nose piece which gives complete protection.

With the direct laryngoscope a differential diagnosis of simple acute, edematous, subglottis and membranous laryngitis can be made. The appearance of the membrane attached to the false cords, true cords and subglottic space, whitish or grayish in color, is characteristic. It is not possible to say from the color of the membrane whether the case is diphtheria or streptococcus infection. In diphtheria the membrane is seen attached to the same surfaces as in membranous laryngitis. If it were possible to examine these patients in the very beginning of the disease, it is probable that intubation would become a thing of the past with the prompt administration of antitoxin. By direct laryngoscopy diphtheria and membranous laryngitis can be diagnosed from spasmodic laryngitis and laryngismus stridulus.

Tuberculosis of the epiglottis. In cases in which the diagnosis of circumscribed tuberculosis of the epiglottis has been made, the best treatment is thorough removal through the direct laryngoscope followed by applications of formalin, carbolic acid and lactic acid. Sensation is deadened with alypin. In extensive disease the entire epiglottis may be removed with the use of a large cutting tip. The advantage over the mirror is that one sees exactly what he is doing and hemorrhage is much better controlled by direct pressure. In

tuberculosis of the posterior wall and the arytenoid cartilages, one should not hesitate to operate through the tube and to remove as much diseased tissue as may be necessary. In patients with painful deglutition curettage is the best method of treatment often relieving pain as if by magic. Ulcers are best treated by biting them out and applying formalin later. All these operations are, of course, dependent upon mild symptoms or quiescent lesions on the part of the lungs. When active symptoms are present, no operation should be attempted unless pain is so great as to endanger life from starvation. Some years ago the writer was consulted by a man, 30 years old, for some pain on swallowing and a husky voice. No general symptoms such as cough, expectoration, night sweats or temperature were present. While the patient was rather frail as to physique, he had no difficulty in doing his work as an electrician. Examination with the mirror showed infiltration and ulceration of the left border of the epiglottis with some thickening of the posterior wall. Before attempting any treatment of the larynx, the writer advised examination of the lungs; the patient consulted Dr. L. P. Hamburger, who, after two examinations, could find nothing suggestive of tuberculosis. It was impossible to examine for tubercle bacilli since there was no expectoration. The writer then proceeded to remove the infiltration and ulceration of the epiglottis and the thickening of the posterior wall through the direct laryngoscope. After the operation it looked as if all diseased tissue had been removed. Dr. J. L. Hirsh examined the tissue making a number of sections through the different specimens. He reported the presence of giant cells and tubercle bacilli which left no doubt as to the diagnosis. After a few applications of lactic acid the wounds healed, the voice cleared up and the patient was apparently well. After healing, the epiglottis showed where the tissue had been removed. The patient was advised to change his vocation and to live in the open air; he soon began to gain in weight and at this time, four years after his infection, looks the picture of health. This case has never been reported as one of primary laryngeal tuberculosis because such cases are so extremely rare but clinically it was one.

In 1911 the writer was consulted by a lady who, shortly after the birth of her baby in the latter part of 1910, developed pulmonary tuberculosis. She responded to treatment, the lungs becoming quiescent. In February, 1911, her voice became husky. With the mirror the posterior wall showed a thickening which was evidently the cause of the huskiness. Under alypin anesthesia the thickening was removed through the direct laryngoscope with the head straight. Applications of lactic acid were then made with the result that healing took place and the voice became normal. The patient remained well until September, 1911, when she developed intestinal symptoms which proved to be tubercular and resulted in death in November of that year. In the case of a man with a large tubercular ulcer of the left false cord causing severe pain on deglutition, curettage through the direct laryngoscope followed by cauterization resulted in complete relief of pain. In this patient pulmonary symptoms were active but it was thought better to operate than to see him starve. The best method of applying the electric cautery is through the direct laryngoscope; the treatment of tubercular lesions with the cautery has opened up a new field for therapy.

Singer's nodules. These tumors are best treated by removal through the direct laryngoscope. With the mirror it is impossible to remove such small growths without danger of injuring the vocal cords. Under alypin anesthesia with the small tube and the head straight, it is comparatively easy to bite off the top of the nodules so that the shrinkage of healing makes the cords smooth. Since the tumors are situated at the junction of the anterior and middle thirds of the cords, it is obvious that one must use a tube which will expose the anterior commissure without force since the hand must be steady to operate without injuring the cords. With a large tube this is impossible. One should use a small straight cutting tip which will cut along the surface of the cord and not a pointed one to attempt to pick off the nodule. After thorough anesthetization the laryngoscope is passed and the forceps introduced down to the nodule; the blades are opened to cut from the side and not at the point. The inner point is shaved off and the remainder shrivels up. The opposite nodule is then treated the same way. If one is skilled in direct laryngoscopy, the rest cure is never necessary in singer's nodules. The tip which the writer uses is made by Pfau; it is a tiny instrument and works perfectly with his universal handle. Three years ago a young lady consulted the writer for slight hoarseness which prevented singing. She had singer's nodes and when they were removed as above described, her voice cleared up permanently. The removal of the nodes is probably the most difficult operation through the direct laryngoscope but the writer considers it easier than the simplest operation with the mirror. Fibromata on account of their size are easily removed through the direct

laryngoscope. The writer makes it a rule to apply the high frequency spark to the site of every tumor after removal. Since these tumors are often situated in the anterior part of the larynx, it is necessary to use a small tube to expose them properly.

Papillomata are by far the most important benign tumors of the larynx in both adults and children in whom they are nearly always multiple, frequently closing the larynx and endangering life and recurring again and again after removal. In adults they sometimes recur in the young and undergo malignant degeneration in the old. Some laryngologists claim that they are always the precursor of malignancy in the old but there are undoubtedly cases of benign papillomata after 60 years of age. Before the introduction of the direct laryngoscope, multiple papillomata were among the most serious cases the laryngologist encountered. Because of the difficulty of seeing the child's larynx, the diagnosis was often guessed at. Even when the tumors could be seen, the treatment often in vogue was a tracheotomy, the canula being worn in some cases several years until the growths disappeared. In the meantime the child was subjected to all the dangers of the chronic tube wearer. In some cases the wearing of the tube caused granulations to spring up in the trachea with a resulting stricture after the removal of the tube. A few laryngologists performed laryngotomy for the removal of the growths but the operation did not meet with popular favor because of the traumatism to such a small larynx. With the introduction of the direct laryngoscope the treatment was placed on a rational basis. The writer has no hesitancy in saying that laryngotomy is never and tracheotomy seldom required in these cases. If the patients are gotten in time, before dyspnea or cyanosis develop, they can all be cured in a comparatively short time. The writer wishes to emphasize the importance of treating all papillomata of the larynx with the high frequency spark, which, properly used, has the power of destroying the growths quickly and permanently. It is easily applied and does not injure normal tissue except by prolonged contact.

About a year ago Dr. A. M. Shipley referred to the writer, a boy, 19 months old, for aphonia and cyanosis which was particularly noticeable on crying. At the University Hospital he was wrapped in a sheet and examined with the head straight on the table and steadied by a nurse. The small tube was introduced and the larynx being exposed, was found filled with multiple papillomata some of which were at once removed with Pfau's cutting forceps. The patient was then taken to the Presbyterian Hospital for treatment with the high frequency spark which caused the tumors to melt away so rapidly that in three months, the patient was discharged cured. The spark used was about one-fourth of an inch long and was applied directly to the tumors through the tube. Up to this time there has been no recurrence. In August, 1912, a female, 69 years old, was referred to the writer by Dr. W. F. Downes for shortness of breath on exertion. Examination with the mirror showed a large tumor, covering the glottis, leaving a small opening posteriorly for breathing. The epiglottis hung so low it was impossible to see the origin of the growth. The patient was immediately examined with the small direct laryngoscope and when the epiglottis was pulled forward, it could be seen that the tumor arose by a broad base from the right inferior surface of the epiglottis. A large part of the mass was at once removed with Pfau's cutting forceps. Hemorrhage was profuse and the patient was put to bed for 24 hours. Dr. H. J. Maldeis, the hospital pathologist, reported that the tumor was papillomatous in character with two points of suspicious in-growth. The following week the high frequency spark, one-fourth of an inch in length, was applied to the base of the growth. Two weeks later the patient returned and it was impossible to tell whence the tumor had sprung. Up to this time there has been no recurrence.

About a year ago a male, 37 years old, consulted the writer for hoarseness which was almost raucous in character. On examination of the larynx a tumor was seen directly in the anterior commissure with attachment below the cords in the subglottic space. On phonation the growth would rise and insert itself between the cords causing hoarseness. Under local anesthesia with the head straight the small tube was introduced; the anterior commissure was exposed and the tumor was removed in two bites of a curved biting tip. The voice returned at once. Microscopic examination showed a fibromyxoma. The ease of removal from the anterior subglottic space would have convinced anyone of the superiority of the direct over the indirect method.

The next case illustrates the value of the direct method when the mirror fails. A male, 30 years old, consulted the writer for hoarseness of a year's duration. Three years ago he had a papilloma removed from the left vocal cord by the indirect method. For two years his voice was normal; then hoarseness developed which gradually grew worse. Examination with the mirror was not satisfactory because of a low hanging epiglottis and a large

uvula. A small growth was seen which was thought to be on the left vocal cord. The same afternoon the larynx was anesthetized with 20% alypin solution and the small tube was passed with the head straight. When the larynx was exposed the small growth on the left was seen below the vocal cords while on the opposite side there was a large tumor covering the true and false cords; in the anterior commissure was another growth. With Pfau's forceps the papillomatous tissue was soon cleaned out and the false and true cords exposed. In another patient who had three operations for papilloma of the left vocal cord by the indirect method, the small tube was passed with the head straight and the tumor successfully removed so that there has been no return. Papillomata in children are so important on account of the small larynx and the difficulty in treatment, it may not be amiss to go into the treatment through the direct laryngoscope which has been successful in the writer's hands. In the beginning it is well to repeat that anesthesia, local or general, should never be used in young children. It is far better to operate without anesthesia than to subject a child to its dangers. The little patient is held on the table with the head straight as above described. The small tube is passed between the incisor teeth and the larynx quickly exposed. When the papillomata are seen, Pfau's cutting forceps are passed through the tube and as much of the growths cleared out as possible. By working carefully normal tissues are not injured. If bleeding obscures the view, adrenalin chloride, 1 to 3000 is used. A small copper wire, attached to a fulguration outfit, is now passed and the high frequency spark about one-fourth of an inch long is applied to the bases of the growths. If the masses are extensive, almost closing the larynx, the patient is kept in the hospital a day or two. With this treatment most of the papillomata can be destroyed at one sitting. One week later the treatment is repeated and so on until the patient is cured. It makes no difference how small the throat is, the small tube can be successfully used. If direct laryngoscopy had made possible nothing else than the successful treatment of papillomata in children, its fame would be safe for all time. With this treatment papillomata can now be cured in a few weeks while the old methods required months or even years. Fulguration is much more difficult to use with the head in extension over the end of the table. The writer is convinced that if this method of treatment is generally adopted, tracheotomy would be done rarely. No laryngologist would think of advising a laryngotomy and yet the writer has recently heard of a case in one of our leading hospitals in which a surgeon—not a laryngologist—did the operation, scraped the papillomata and surrounding tissue thoroughly with a curette and sewed up the larynx. The wounded surfaces promptly grew together causing complete stenosis of the larynx; the patient is wearing a tracheal canula and the surgeon is wondering how she will get rid of it. With modern methods of treatment such a termination would be impossible. In these cases of papillomata in which dyspnea and cyanosis are marked, it is better to do a tracheotomy because these symptoms show almost complete closure of the larynx and the operation gives one a chance to clean out the growths. In a short time the canula can be permanently removed. Laryngologists must impress upon parents and the public generally, the importance of examining the larynx in adults and children when hoarseness persists for any length of time. If children can be treated in the beginning of papillomatous growths, there will be no tracheotomy.

In malignant growths the writer does not advocate any intra-laryngeal operation. But in cases of doubtful diagnosis direct laryngoscopy assumes an important place as regards removal of specimens for miscroscopic examination. With various cutting tips it is possible to cut as deeply as may be desired. To work with certainty, however, one must have the head straight to secure muscular relaxation and must use a small tube. Then it is no more difficult than removing tumors. A letter from a fellow laryngologist in another city may be interesting as bearing on this point. He says: "I had three months ago the chance to remove by direct laryngoscopy with your position a carcinoma of larynx invading the right vocal cord above anteriorly, partly also the ventricle Morgagni and region below the vocal cord (about a big hazelnut) in such a successful way that the voice is completely restored, no recurrence is visible and the vocal cord is restored."

The writer does not advise such operations in malignant growths but if one decides on intra-laryngeal interference, he will certainly find the straight position of the head and the small tube the easiest and best method of operating.

In recurrent paralysis of a vocal cord the diagnosis can usually be made with the mirror. If, for any reason, the larynx cannot be seen, the diagnosis can be made with the direct laryngoscope. So little force is used in holding the epiglottis forward with the small tube that the patient has no trouble

phonating; the paralyzed cord in the middle line and the other cord moving over to meet it are easily seen and the diagnosis established. In the treatment one can apply the electrode directly through the tube. Under this heading it is interesting to note that Brunings has introduced a new method of treating old paralyses of the vocal cords. Since all the readers of this monograph may not be able to read it in his book, the writer will copy his description of it. He says: "The endolaryngeal 'plastic' with hard paraffin aims at achieving the direct opposite of dilatation, *i. e.*, at diminishing pathological widening of the larynx, which prevents proper closing of the glottis. Up to the present time I have only employed the method to overcome the phonetic and respiratory disturbances produced by one-sided recurrent paralysis, but have obtained such remarkable results that a short description of them may be given here. Disabilities which remain in the cases of old compensated one-sided recurrent paralysis are to be attributed to weakness and atrophy of the paralyzed vocal cord. This condition not only results in a defective closure of the glottis, and consequent incapability of energetic coughing, but leads to an excessive expenditure of air in speaking, so that the voice becomes weak and usually hoarse, and inclined to go into falsetto. The pitch of the voice is also in most cases too high, owing to the compensating hypertrophy of the other vocal cord and of the strong innervation necessary for the overcrossing. I have therefore made an attempt to restore the normal phonatory position to the limp atrophic vocal cord by means of injection of hard paraffin. As the vocal cord movements occur in a transverse direction, it was to be expected that the plastic might result, not only in the restoration of the respiratory closure of the glottis but also in the removal of the phonatory disability.

"The apparently difficult technic of the vocal cord plastic may be easily learned with the help of counter-pressure autoscopy. For it I use one of the ordinary screw syringes for hard paraffin, on the end of which a canula about 18 centimetres long by 1 millimetre wide is fixed. At the end of this canula there is a fine, short, bent, bayonet-shaped needle soldered on. The syringe holds 2 c.c. of hard paraffin of 42 to 43 degrees melting point. To carry out the plastic, the paralyzed side of the larynx is presented by means of counter-pressure autoscopy from the opposite side of the mouth, the lamp being in the high position. Injection is performed best, at the first sitting, in three places, the two outer of which are close to the anterior and posterior end of the vocal cord. The puncture should be made midway between the free edge of the vocal cord and its lateral limit. Each of these pieces receives about 1/6 to ¼ c.c. of hard paraffin, according to the varying individual circumstances. The assistant who is checking the screw syringe should count the revolutions aloud in order to be able to reckon the injected dose accordingly. The determination of the proper depth of puncture offers no very great difficulties. If the puncture is too deep, the paraffin is seen at once in the subglottic space. The needle is then slowly drawn back during the further injection, in order to distribute the paraffin over the whole thickness of the vocal cord. The fear, also, lest the injection might produce separate protuberances at three places has proved to be groundless, as the intervening spaces are apparently equalized by means of reactive cellular activity. I have never seen any considerable degree of edema after the injection, but it is well to make the patient spare the voice for two or three days. After this, phonation exercises should be commenced with as deep a voice as possible, and with all possible economy in using the expired air. Slight inflammatory reactions, which may occur in the first days, produce no disturbance. I have up to the present time treated seven patients by this new method, and as most of the cases were of old standing (half to two years), the maximum atrophy had set in, and spontaneous improvement was no longer to be expected. The result was in three cases quite surprising, and the respiratory disturbances were also completely removed in the four other cases. The patients were able in a few days after the injection to speak and cough in a normal manner, and the voice weakness and the phonatory expenditure of air had improved even to the point of completely disappearing. On the other hand, the voice acquired a strong, but in singing, a somewhat rough sound. In each case the patients were entirely satisfied with the result of the treatment. It seems advisable, according to present experience, not to inject more than ½ c.c. Should the correction be found to be still insufficient after eight days—that is to say should the vocal cord not be in the median line—a second injection may be made. With regard to the duration of the results, I am unable at present to judge; my longest standing case has remained without change for more than half a year. It is possible, according to results which have been obtained otherwise with paraffin plastic, that the injection would require to be repeated after some years. Hitherto I have only performed the injections in a direct manner, and

they offer no difficulties in cases where the conditions of autoscopy are not too unfavorable. The indirect procedure would here be extremely uncertain."

The writer wishes to say that with the straight position of the head and the use of the small tube, he considers all cases favorable for direct laryngoscopy. He cannot imagine a case in which, with patience and perseverance, the larynx could not be examined. He has repeatedly performed both simple and difficult operations through the small tube and is therefore in a position to say that an apparatus to force the larynx back, such as is exemplified in Brunings' counter-pressure instrument, is never necessary in direct laryngoscopy. He thinks he can also say with certainty that general anesthesia is never necessary in direct laryngoscopy except in older children who cannot be held and in certain nervous cases such as chorea.

Stenosis of the larynx. In the treatment of stenosis of the larynx, direct laryngoscopy occupies the first place. It gives the means of seeing exactly how much of the larynx is closed and of cutting through the cicatrized tissue as no other method can. The writer's method of procedure in these cases in adults is to examine first with the mirror and then to use direct laryngoscopy, with the knife ready to cut through the diseased tissue. If the stenosis is complete, the patient is already wearing a tracheal canula. In such cases the cicatrix is immediately cut through in the middle line with no attempt to save the vocal cords because they are usually so tied up in the cicatrix as not to be visible. The opening is then dilated until a large intubation tube passes easily. The tracheal canula is removed and a forceps passed through the tracheal wound to clamp the lower part of the intubation tube; a hard rubber piece is then screwed on the handles of the forceps to hold the tube permanently in the larynx. This apparatus was devised by Dr. John Rogers and, in the opinion of the writer, is the best method of treating stenoses. The tube is removed from time to time, cleaned and replaced. In children the treatment is carried out with the patient flat on the table and the head straight. The small tube is passed, the operation performed through it, if necessary, and Rogers' apparatus applied. In practically all cases the bowl of the intubation tube will be too large for the patient, adult or child, to swallow comfortably and it must be shaved down considerably. One of the writer's patients has worn his tube six months without extubation and breathes as easily as when it was first put in. The writer prefers this treatment to laryngostomy, the after treatment of which is usually more or less painful. In children the tube must be removed every two or three weeks because the small tube stops up with thickened secretion.

Some years ago a girl, 6 years old, was brought to the writer from Cumberland, Md., with the history of difficult breathing for six months. She was examined with the head straight on the table and, on exposing the larynx, a membrane which resembled cuts of congenital web was seen between the anterior two-thirds of the vocal cords allowing a small space posteriorly for breathing. Since the membrane appeared thin a successful attempt to break through it with a six year intubation tube was made. The patient wore the tube two weeks at the end of which time it was removed, cleaned and replaced. The mother took the child home and, instead of bringing her back in a month, as she had been instructed to do, returned in two months. On the removal of the tube the direct laryngoscope showed the larynx clear and, since the voice was practically normal, the patient was discharged as cured.

In January, 1912, Dr. R. A. Warner asked the writer to see a child, 2 years old, at the Sydenham Hospital who had been intubated for diphtheria and had worn the tube five days; during convalescence dyspnea developed and grew gradually worse until the breathing could be heard over the room. The little patient was examined with the direct laryngoscope with the head straight. Exposure of the larynx showed a large subglottic mass springing from the left wall of the larynx and almost closing the lumen. The patient was immediately intubated with a one year tube and taken to the Presbyterian Hospital for observation and treatment. That afternoon she coughed the tube up; an attempt to pass a two year tube failed so the first tube was replaced. That night she again coughed the tube up and was hurried to the writer's office in a taxicab gasping for breath and markedly cyanotic. She was intubated at once and taken to the hospital where the writer did a tracheotomy with the intubation tube in the larynx. When the trachea was entered, the tube was pushed up. The patient recovered promptly and a few days later Rogers' apparatus was adjusted. It was removed every two weeks and the larynx examined directly. It was interesting to watch the disappearance of the pathological mass from fortnight to fortnight. It slowly melted away and in May the larynx appeared normal so that the apparatus was removed permanently. The child has remained well with a normal voice.

In April, 1912, Mr. B., 26 years old, was referred to me by Dr. Murphy of Wilmington, North Carolina. In July, 1911, he was stricken with typhoid fever and during convalescence developed dyspnea which grew gradually worse until tracheotomy was necessary. When the writer saw him he had worn his tube about six months. Examination with the direct laryngoscope with the head straight showed complete closure of the larynx except posteriorly where a small probe passed through. To relieve the stenosis, the larynx was cut through with a long knife introduced through the direct laryngoscope, care being taken to cut in the middle line. The vocal cords were tied up in cicatricial tissue so no attempt was made to save them. The opening was then dilated until a large intubation passed through. Rogers' apparatus was then applied and the patient allowed to go to his home in South Carolina where he has had charge of a large saw mill. He is well and his only inconvenience is his voice which is a whisper.

One of the few cases which the writer was compelled to examine under general anesthesia was a deaf mute, who, one month before, fell and struck his larynx on a wheelbarrow. The attendant noticed, a few days later, that he had lost his voice entirely and was breathing hard. The dyspnea increased rapidly so Dr. J. J. Carroll asked the writer to make a laryngeal examination. The patient was affected with chorea and the attempt with the direct laryngoscope not only failed but caused such labored breathing that the trachea had to be opened under local anesthesia with the patient sitting. A few days later he was given ether through the tracheal canula and the larynx examined through the direct laryngoscope with the head straight on the table. The anterior part of the larynx was closed with cicatricial tissue which was opened through the tube and Rogers' apparatus applied. The patient wore the tube until the middle of September at which time he was put to sleep and the larynx examined again directly. Healing appeared complete so the tracheal canula was introduced and the patient kept in the hospital for observation. The next morning he pulled the tube out and, two hours later, when he was found, the resident physician was unable to replace it. He developed no untoward symptoms and a few days later was allowed to return to the asylum. Though syphilis is said to be the chief cause of stenosis of the larynx, all of the writer's cases except one have been due to other causes.

Foreign bodies in the larynx. Foreign bodies in the larynx are rare. If a large object lodges in the glottis, asphyxiation usually results before a physician can be called; if small it is apt to slip between the cords into the trachea or bronchi. The writer has seen only one case of foreign body in the larynx and it was strange that the child did not suffocate. A little girl, 2 years old, while eating soup, swallowed a bone which caused violent coughing and cyanosis. The symptoms subsided and, aside from occasional cough and loss of voice, she was in fair condition. A specialist attempted to remove the bone which he thought he located in the larynx. As was to be expected the mirror failed in such a small throat. He then brought her to the writer for direct laryngoscopy. At the urgent solicitation of the parents and against the writer's better judgment, chloroform was administered. With the head straight the small tube was passed and, as soon as the larynx was exposed, the bone was seen wedged in the glottis. The foreign body was seized with Pfau's forceps and removed by exerting some force on the instrument. To the eye there seemed no space left for the patient to breathe through. The bone was swallowed Sunday and was removed Thursday afternoon. The patient made an uneventful recovery. In this case a general anesthetic was dangerous and should not have been given. Never again will the writer allow the pleadings of the parents to overcome his better judgment. It is not necessary to emphasize the ease with which foreign bodies can be removed from the larynx with the head straight.

Pemphigus of the larynx. A short time ago at the request of Dr. Hiram Woods, the writer examined a boy, 9 years old, who had pemphigus of both conjunctivae. His voice became husky and he had difficulty in swallowing solid food. The boy was wrapped in a sheet and examined with the small tube with the head straight on the table. When the larynx was exposed, both cords were found somewhat thickened and on the posterior wall was a white swelling similar in appearance to a swelling on the conjunctiva of the left lower lid. The disease was evidently an extension of the pemphigus to the larynx. No treatment was attempted but the larynx will be watched and if closure threatens, Rogers' apparatus will be introduced. The description of the changes at the upper end of the esophagus will be reserved for another chapter. Only one other case of pemphigus of the larynx has come under the writer's notice; in Krause's clinic in Berlin, he saw a distinct bleb on the epiglottis.

A few days ago a little patient, 14 months old, was referred to the writer by Dr. Lee Cohen whose

direct laryngoscopes were too large to allow a satisfactory view of the larynx. The child had had a peculiar crowing sound in breathing since birth. After exercise the sound was louder and the mother was becoming alarmed though there was never shortness of breath or cyanosis. The patient was examined with the small tube with the head straight on the table. When the larynx was exposed, the tissues seemed a little thickened but not enough to account for the noisy respiration. The vocal cords did not seem to open as well as perfectly normal cords and it was not possible to get a good view of the subglottic space. In view of the negative findings no treatment was recommended but the larynx will be examined from time to time as a precaution.

Just to show that the straight method is as easy in young babies as in older children, the writer wishes to cite a case which he saw some years ago at the Garrett Hospital at the instigation of Dr. J. Staige Davis. A little patient, 11 months old, was intubated for diphtheria and during convalescence, developed dyspnea which gradually increased. At the examination a subglottic stenosis was found. Despite the small larynx no difficulty was experienced in the examination.

The safety of direct laryngoscopy. The writer considers direct laryngoscopy absolutely safe under normal conditions. Even when the contraindications are present, such as arterio-sclerosis, dyspnea, etc., the use of the small tube and the straight position of the head make the method practically safe. The writer does not hesitate to examine any case in which he thinks direct laryngoscopy may be of help.

The practicability of direct laryngoscopy. When one becomes expert with the tube, he can examine the larynx almost as quickly as with the mirror. Five minutes is a fair estimate and one is well repaid for the direct vision. A great advantage is that an operation can be immediately performed. The difficulty of examining children with the mirror makes direct laryngoscopy indispensable in this class of cases. With the method described above, one can examine the child's larynx in two minutes without pain or traumatism.

Anesthesia in direct laryngoscopy. Anesthesia was taken up in a general way in Chapter 11 but it is a subject of such importance that a few words here may not be amiss. If cocaine is used, a 4% solution should be brushed over the wall of the pharynx and the epiglottis with a curved applicator. After waiting two or three minutes the laryngoscope is introduced, the epiglottis pulled forward and a straight applicator, holding a 10% solution is applied to the larynx. In a few minutes the larynx is sufficiently deadened to proceed with the examination. If an operation is necessary, more cocaine may have to be used. This drug must be used cautiously for one never knows when he may strike a patient with an idiosyncrasy for it. Two years ago the writer used a small quantity to anesthetize the larynx and trachea for a bronchoscopic examination. The patient felt perfectly well after the examination and was allowed to leave the hospital. He took a car and, after leaving it, went into a restaurant to get supper. He remembered nothing after paying his bill. At 10.30 o'clock that night he was arrested for drunkenness and, after a hard fight with two officers, was taken to the station house where he had to be forcibly held to prevent his doing himself bodily harm. At 1.30 o'clock in the morning, after he had quieted down somewhat and it was learned that he was suffering from cocaine poisoning, he was taken to the University Hospital where under the influence of sedatives, he gradually recovered. At 9.00 o'clock A. M. when the writer saw him, he was rational but remembered nothing that had happened the night before. At 2 o'clock P. M. he was nervous and excited and upon inquiry it was found that he had been given atropine. This was stopped and that night he was in good shape except for weakness. He afterwards told the resident physician that the application of a belladonna plaster would poison him. This case is cited to show how dangerous cocaine may be; the writer believes every patient should be questioned before the use of the drug as to possible idiosyncrasies. Since this experience the writer has used no more cocaine. His method of anesthetizing the larynx now is as follows: The pharynx and epiglottis are brushed over with alypin or novocain solution (20% solution). After waiting two minutes the tube is introduced and a solution of the same strength applied to the larynx. This suffices for an ordinary examination. If an operation is necessary, the same solution is applied to the vocal cords. If, perchance, a general anesthetic is needed, the writer's preference is ether preceded by a hypodermatic injection of atropine. In children no anesthetic is used for examination or operation. Cocaine is dangerous and they are so easily held on the table that no anesthetic is necessary. Formerly all adult patients received a hypodermatic injection of morphine and atropine, but this has been discarded as unnecessary. In a book on diseases of the larynx published comparatively recently, the following is found: "Inspection

of the larynx is difficult in the young child but is usually possible if he is firmly secured in a blanket and held in a nurse's lap. It is not possible to hold the tongue in the ordinary way so that Bleyer's or Escat's depressor must be used. The chief difficulty is that mucus and froth obscure the view; but this may be greatly diminished by the use of cocaine which must, however, be applied with caution in children; general anesthesia is sometimes necessary. Killian's tubular speculum is especially valuable for children. Lately Killian has introduced a tubular speculum which is of great value for certain cases, such as the removal of papillomata in children. It is necessary that the head be bent very far back and usually a little to the right side so that the speculum may be in the left angle of the mouth. In adults the tube may be passed with the patient in the sitting posture under thorough local anesthesia; but in children, at any rate, a general anesthetic is necessary, the patient being placed in the lateral position or on the back the head hanging over the end of the table." The writer mentions these views simply to condemn them. General anesthesia in direct laryngoscopy in children increases enormously the dangers and no expert at the present time would use it. As mentioned above it should be reserved for the few adult patients who through nervousness or other cause will not permit examination under local anesthesia. Children can be so easily handled without local or general anesthesia that it would be a waste of time to use either.

(To be continued.)

TUBERCULIN IN THE DIAGNOSIS OF OBSCURE CONDITIONS IN THE GENITOURINARY SYSTEM.

If the tuberculin reaction is focal, as I have repeatedly seen in renal tuberculosis, one starts the operation with a well-considered plan, knowing just what one has to do. Exploratory inspection of a kidney in the early stages of tuberculosis is a most unsatisfactory method of diagnosis, and frequently leads to mistakes, and just in this type of case one may be fortunate enough to clear up the diagnosis with tuberculin by obtaining a focal reaction. If this fails the exploratory operation will be in order. . . . . I do not use the tuberculin test without first carefully studying the case under consideration. I make it a rule to employ every available means of diagnosis before resorting to the use of tuberculin. When the diagnosis can be made without tuberculin, which is the rule rather than the exception, I make no use of this preparation. Moreover, in patients with advanced tuberculosis in the lungs or other parts, I would not use this poison. —EDWIN BEER in the *Medical Record.*

OVARIAN GESTATION.

Being principally a review of the literature.

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The statement that fecundation of the human ovum normally and almost invariably occurs within the lumen of the Fallopian tube has been so frequently and repeatedly reiterated in textbooks and elsewhere that correctness of the observation is seldom seriously questioned. The fundamental proposition has apparently been ignored or overlooked that, if this were literally true, in the nature of things there would be but few normal intrauterine pregnancies followed by natural delivery, i. e., nearly every gestation, from beginning to end, would almost necessarily be of the ectopic variety!

While obviously the purpose of the tubal ciliated epithelia is to assist migration of the unimpregnated ovum toward the normal place of fecundation (the uterine cavity), it appears equally obvious that an ovum fertilized in the outer one-third of the ductus Fallopius could seldom reach its ultimate destination, because of (a) the rapidity of development of the products of conception, and (b) the disproportion of the tubal lumen near the uterus as compared with the outer extremity.

In thus criticising current professional opinion the pertinent facts have not been overlooked, (a) that normal spermatozoa may survive with unimpaired vitality and motility many days (exact period undetermined) within the cervix, and the uterine cavity, (b) that not infrequently they enter the lumen of the Fallopian tube and there fertilize the ovum, (c) that they occasionally traverse the entire length of the tube and impregnate the ovum before its liberation from the Graafian follicle. However, prevailing impressions to the contrary notwithstanding, it is desired the dicta be emphasized that (1) in the *genus homo femininis* at least fecundation normally takes place only within the uterine cavity, that (2) whenever the ovum becomes fertilized elsewhere the occurrence should be regarded as accidental and abnormal.

Although medical history clearly indicates the fact that ovarian gestation was at least microscopically recognized early in the seventeenth century, and while subsequent gynecological literature details examples thereof demonstrated beyond peradventure by histological investigation, there were those of high professional standing who continued to seriously question the possibility of its occurrence, i. e., the hypothesis was disputed that it was possible for the ovum to become fertilized before its liberation from the Graafian follicle. Foremost

among these was the illustrious Bland-Sutton who (prior to 1901) remarked that he was convinced from his experience and observation that primary ovarian gestation had no existence; Lawson Tait contended that extra-uterine pregnancy was never ovarian, but always tubal; Kelly and many others claimed ovarian gestation must be exceedingly infrequent because never encountered in their experience, and the possibility thereof being so remote it might as well be entirely ignored; as late as 1905 Wathen declared "ovarian pregnancy is so infrequent as hardly to be worth considering, and but few authenticated cases are on record."

During the period when the existence of ovarian gestation was thus vigorously disputed, details concerning celiotomy for ruptured extra-uterine pregnancy, pelvic hematocele, peritonitis, pelvic cellulitis, ovarian hematoma, "blood-cyst" of the ovary, ovarian apoplexy, etc., were commonly recorded in gynecological literature. Evidently it did not occur to the distinguished operators that in the majority of instances the so-called "blood-cyst" of the ovary, pelvic hematocele, ovarian apoplexy, "rupture of the ovary," could be legitimately included in the classification of ovarian hematomata, the origin of which might more often than otherwise be ovarian gestation!

On the other hand, however, although accurate ante-operative diagnosis for obvious reasons remained impracticable, long before 1901 German writers frankly admitted the possibility of ovarian gestation, and while several examples had previously been demonstrated following celiotomy or necropsy, Spiegelberg (1878) was the first to formulate definite indications, the fulfillment of which he claimed must be assured to establish a positive anatomical diagnosis, viz.:

(1) That the Fallopian tube must be intact and have no organic connection with the gestation sac:

(2) That the gestation sac must occupy the position of the ovary, and be connected with the uterus by the ovarian ligament:

(3) That definite ovarian tissue must be found in the sac wall.

While it is admitted that the foregoing criteria are important from the viewpoint of positive anatomical diagnosis, unless celiotomy be undertaken during the first few weeks of the gestation, fetal development may have so altered or destroyed normal topographical relationship as to render accurate diagnosis impracticable. Particularly is satisfactory diagnosis impossible, even after careful histological investigation, if celiotomy be long delayed, e. g., in not a few instances has necropsy demonstrated that long-standing lithopedios most likely owed their origin to ovarian rather than tubal or abdominal gestation, there being complete obliteration of the ovary and utero-ovarian ligament, the corresponding Fallopian tube being normal in location, size and conformation.

It is recognized that literally utilization of the designation "primary" ovarian gestation should be restricted to those examples in which fertilization of the ovum occurs before its liberation from the Graafian follicle, yet for reasons hitherto suggested demonstration of this feature may be absolutely impossible by any known method of examination. Therefore, certain modifications in the criteria of Spiegelberg seem essential, and since investigation heretofore prosecuted has suggested no reasonable and understandable explanation for the existence of so-called "blood-cyst" of the ovary (ovarian hematoma), pelvic hematocele (ovarian hematoma), apoplexy of the ovary (ovarian hematoma), rupture of the ovary (ovarian hematoma), etc., the following additional dicta appear pertinent:

(a) Provided the Fallopian tube be intact, i. e., unruptured, normal in location, size and conformation, if the ovary be implicated as suggested, even though "the gestation sac may not (invariably) occupy the position of the ovary" (Spiegelberg), ovarian gestation cannot be positively excluded:

(b) Provided the Fallopian tube be normal, if the ovary be markedly enlarged, even though histological investigation may not positively demonstrate "definite ovarian tissue in the sac wall" (Spiegelberg), ovarian gestation cannot be certainly excluded:

(c) Provided the Fallopian tube be normal, if the ovary be ruptured or incorporated in a cystic tumor, including the so-called pelvic hematocele, etc., more often than otherwise the origin is ovarian gestation:

(d) Provided the Fallopian tube be normal, if the ovary be entirely obliterated, as occurs in large tumors, lithopedion, etc., the ligamentum ovarii proprium may also be obliterated, hence the fact that the "gestation sac is not connected with the uterus" (Spiegelberg) is immaterial so far as the diagnosis is concerned.

Regardless of the diagnostic and anamnestic acumen of the observer, it is admitted without serious disputation that the ante-operative diagnosis of ovarian gestation is a physical impossibility, there being nothing pathognomonic in the clinical history nor the subjective and objective symptoms by which differentiation is practicable from other varieties of ectopic gestation, the conditions being the same

whether rupture has or has not supervened. Therefore, more often than otherwise the diagnosis is perfected anatomically only after either operation or necropsy. However, so far as treatment is concerned, the uncertainty in diagnosis is unessential, since prompt celiotomy with removal of the products of conception is imperative in every instance of extra-uterine gestation whether the variety be ovarian, tubal, or abdominal.

In discussing ovarian gestation, Gilford remarks that the first instance on record of impregnation of an ovum within a Graafian follicle is probably that which is mentioned by Bernutz and Goupil, that the second was recorded by Granville in 1820. Whether these observations are correct or otherwise is immaterial so far as this dissertation is concerned. The author mentioned (Gilford) in 1901 collected sixteen positive and twelve probable examples of ovarian gestation (total of twenty-eight), and suggests that many may have been recorded as blood cysts, rupture of the ovary and ovarian apoplexy. One explanation of how conception can occur within the Graafian follicle is that the sperm cell enters through the aperture produced by the bursting of a follicle and impregnates an ovum which has not yet escaped; the opening then closes and gestation proceeds in the sealed sac(Gilford). Another is that the spermatozoon penetrates the coat of the follicle at its most attenuated part (Schroeder).

Ovarian gestation is also discussed by Scott (1901) who suggests the possibility of ovarian hematomata being thus produced. An example is cited with details of macroscopic and microscopic investigation, his summary being as follows: "Ovarian hematomata are comparatively common, and no explanation has been offered for their occurrence. Continued development of the ovum in ovarian gestation induces such changes in the organs and tissues as to render the demonstration of its ovarian origin impossible. The most natural consequence of early death of the ovum in ovarian gestation is its gradual transformation into an ovarian cystic tumor, retrograde changes obscure its origin, and an hematoma is the final result."

Mayo-Robson cites an example in which the histological findings showed conclusively that fecundation of the ovum took place within the ovary, and agrees that it is not improbable some of the so-called ovarian blood-cysts, or hematomata, may be due to ovarian gestation. To settle the question he suggests the importance of careful microscopic examinations to gain evidence of impregnation, although in some instances owing to early death of the embryo subsequent changes may render identification difficult if not impossible.

Ectopic pregnancy has been observed with about equal frequency within child-bearing limits regardless of age, nationality or social condition, primiparæ and multiparæ being alike subject to the abnormal occurrence, and the ovarian variety is no exception to the rule. Therefore, in presenting excerpts of recorded examples all details concerning age, previous family, personal and parturient history are unimportant and may well be omitted from consideration. It seems superfluous to mention that with the advent of impregnation, whether it be intra- or extra-uterine, there is usually cessation of menstruation for a longer or shorter period, and other symptoms or signs of pregnancy are commonly promptly manifested. However, this is a rule to which there are many curious exceptions, e. g., pregnancy, normal or otherwise, may exist without observable objective or subjective evidence thereof for weeks or months; on the other hand, typical signs of pregnancy may be present in females who have never submitted to the process by which conception may be engendered.

As fairly representing the average record of ovarian gestation, a rather extensive excerpt of the clinical history and histological findings in the case reported by Freund and Thome, of Strasburg, is interpolated. The data given have been copied almost verbatim from an abstract of the original report prepared by Fehring from Virchow's *Archives,* Bd. 183, Heft i, and published in *Surgery, Gynecology and Obstetrics,* May, 1906, pp. 598-9. While this and the more brief additional subjoined excerpts embrace only a few of the recorded examples of ovarian gestation, it is believed sufficient evidence is thereby afforded to reasonably refute the statements of those who claim "ovarian gestation has no existence," or "is so exceptional that it is hardly worthy of consideration."

FREUND AND THOME: Patient aged twenty years, menstrual habits irregular, but after a period of amenorrhea lasting three months considered herself pregnant. In the third month she began to have slight hemorrhages, sacral and abdominal pains. External genitals under-developed, uterus slightly enlarged, firm, and freely movable; at the right of the uterus was a first-sized ovoid tumor, and ectopic pregnancy was diagnosed.

On opening the abdomen, the pelvis was found to contain 60 to 80 c.c. of sero-sanguineous fluid; left ovary normal, but occupied an abnormally high position; tubes shorter than normal, and showed suggestions of infantile folding. The right tube with its fimbriæ was entirely free and "in no way made up" a part of the tumor. The tumor resembled the gestation sac of ectopic pregnancy, and consisted of the enlarged right ovary, whose blood infiltrated surface showed multiple follicle-like projections. No point of rupture could be detected on the tumor wall.

The authors further describe the tumor as follows: "The mass is distinctly separated from the tube and its fimbriæ is irregularly spherical, and measures 6.5 x 5.5 cm. The gestation sac is a spherical cavity 32 mm. in diameter, which is completely lined by the membranes; the latter can be easily stripped from the wall. The thickness of the wall varies from 1.2 to 1.5 cm., except at the placental site, where it is over 2 cm. thick. The cavity contains an embryo 23.5 mm. long, which is connected to the wall by a slightly twisted cord 11 mm. in length."

Microscopically, the wall of the sac showed three layers; the innermost being amnion and chorion; external to this was a layer consisting mainly of erythrocytes, fibrin, and masses of detritus; the outermost layer, not definitely marked off from the latter, was ovarian tissue. The whole periphery of the vesicle showed villi, not numerous, but evenly distributed, and branching into the layer of blood and fibrin. The connective tissue of the villi was well developed. The epithelium of the amnion was in general cubical with ovoid nuclei. The variation in staining of the cell protoplasm in different cells in the same section, and the occurrence of vacuoles, were probably to be regarded as different functional condition of the cells. The syncytium was seen in some places as a simple layer, in others as bud-like masses of densely staining multiform nuclei, or as protoplasmic threads without nuclei. The outer layer of the sac consisted of ovarian tissue—chiefly fibrillar connective tissue. There was no small-celled infiltration, and elastic fibres were completely wanting. This tissue was quite vascular. The blood vessels must be regarded as dilated capillaries. Ova in various stages of development could be found in the outer layer of the sac wall.

From the clinical report and the findings the authors draw the following conclusions:

(1) This was undoubtedly a case of true ovarian pregnancy, for, in the first place, the ovum is completely surrounded by ovarian tissue containing larger and smaller follicles. There is no evidence that the ovum was first imbedded elsewhere and later found its way into ovarian tissue. The tube is separated from the ovary throughout its length, and no part of the fimbriated end is in any way connected with the gestation sac.

(2) Death of the embryo occurred some time before the operation, as evidenced by its small size, compared to the period of gestation. According to the former, it should be three months old, but its size would show it to be not more than five or six weeks. Moreover, there are no vessels in the villi or membranes, and no red blood corpuscles. The latter should be abundant, had the death of the embyro been quite recent. It is, however, possible that the embryo may present some developmental anomaly, as there is some want of differentiation of the face and extremities, but this might be due to post-mortem change. These questions, it is admitted, might be settled by a microscopical study of the embryo.

(3) The amnion (and to a less extent the chorion) continued to grow after the death of the embryo, and were still alive at the time of the operation, as is shown by the appearance of the cell protoplasm and the nuclei. The small number and the wide separation of the villi may be accounted for by the fact that no new ones were formed, and the existing villi were separated by the growth of the chorion. Degenerated villi are found only in that portion of the chorion which would later have become the chorion læve. The growing ovum met greater resistance from the dense ovarian stroma than it would in the uterine or the tubal mucosa, which is shown by the compressed connective tissue adjacent to the blood layer. There is nothing in the chorion to suggest malignancy.

(4) Decidual cells, "as might be expected," could not be found; and if present, it is probable that they would have been found in some of the hundreds of sections studied. The decidual cells may have degenerated, but it is more probable that none were formed. This view is supported by the fact that a number of other observers reporting ovarian pregnancies found no decidual cells. We (Freund and Thome) have previously shown (and this is supported by the researches of Wallingren) that decidual cells are by no means constantly found in tubal pregnancy. If decidual cells are not always present in tubal mucosa (which closely resembles that of the uterus) when it is the site of an ectopic pregnancy, it is not remarkable if they are absent in ovarian pregnancy. The authors claim to have found decidual-like cells in a hemorrhagic multilocular cyst removed from a patient in whom pregnancy could not be excluded. The presence of glycogen and the absence of fat are not proof of the decidual character of the cells.

(5) This pregnancy probably originated in a follicle. Most likely at the time of rupture the ovum did not escape into the abdominal cavity, but remained in the follicle, where it was fertilized. The follicle may have ruptured "into a recently ruptured follicle," which would favor its retention. The follicle may have ruptured into a cystic rest of the Wolffian tract. The ovum may not have been liberated from the *discus proligerus,* and as it may be fertilized in the tube while still surrounded by the *corona radiata,* we (F. and T.) may assume that the discus cells would not prevent fertilization. Finally, the ovum may have been fertilized in the abdominal cavity and become imbedded in a niche on the surface of the ovary. An inflammatory process or a cystic degeneration can be excluded. The abnormal development of the sexual organs must be considered.

GOTTSCHALK: Chief complaint severe pain in right side, diagnosis probable extra-uterine pregnancy. Celiotomy: Specimen showed right tube normal, site of ovary occupied by soft tumor size of orange, uterus normal. The ovarian tumor contained yellowish fluid, in which was the embryo laying in free yolk sac, the amnion being intact. In wall of gestation sac was a Graaffian follicle.

JAGGARD: Seven years previously passed fleshy mass, pronounced by attendant "false conception." Since then every two years prolonged periods of uterine hemorrhage. A year ago passed two men-

strual periods, then copious hemorrhage, confined to bed three weeks, profuse irregular menstruation thereafter. Diagnosis, "granular endometritis, lacerated cervix, small fibroid posterior uterine wall, enlarged ovaries!" Curettment, trachelorrhaphy, improvement. Hemorrhage later recurred, again curetted without benefit. Celiotomy, gestation sac intact developed between layers broad ligament, fetus macerated, tube entirely separate.

EBERHART: Last menstruation June 6th, symptoms pregnancy few days thereafter. July 30th, uterine hemorrhage, "labor-like pains, fever." (This was probably when ovum began to suppurate.) Month later, uterus enlarged, soft, anteflexed, displaced to right; movable, elastic tumor size hen's egg left side. Diagnosis, ectopic gestation. Celiotomy September 8th: Tumor recognized as ovary with left tube passing over it. Interior of ovary rough, granular, contained several follicles, slimy pus mixed with thicker particles (suppuration). Tube impervious both extremities, filled with brittle epithelial masses. Sections of ovary showed distinct villi with tortuous fine vessels; decidua cells not demonstrated. Villi followed by layer containing numerous cells which gradually passed into ovarian stroma. The author remarks: "As the tube was found occluded at both ends, the case is of further interest because extra-uterine transmigration of the spermatozoids must have taken place."

HERZFELD: After normal delivery March 12th, patient noticed "another fetus seemed to be moving about in her abdomen." Abdominal enlargement increased, tumor extended above umbilicus, uterus distinct therefrom. Celiotomy March 24th: Large fetal sac right ovary, fetus nineteen inches long, placenta well-formed, tube normal. No demonstrable ovarian tissue remained in sac. This was true, also, in an example recorded by Sanger.

LANPHEAR: Last menstruation in May, symptoms of pregnancy. August 2nd, uterine hemorrhage, severe left-sided pain. Bleeding ceased, pain continued, great abdominal distension. August 15th, pelvis filled with boggy mass, tumor size of orange left ovarian region. Celiotomy, one and half gallons fluid and clotted blood; left ovary site of gestation, tube practically normal, placental attachment to ovary plainly visible, dead fetus. Microscopic examination, true ovarian gestation.

VAN TUSSENBROEK: Last period six weeks previously, clinical diagnosis, extra-uterine gestation. Celiotomy (Kouwer, 1897), great quantity free blood peritoneal cavity, clots adherent to right ovary. From fourth to seventh day after operation, fragments decidual membrane escaped from uterus. Ovary separate from tube, ovisac contained macerated fetus, and was within a corpus luteum, ovum surrounded by *theca interna.*

WITHROW: Menstruation latter part August, sharp attack left-sided pain October 1st; uterus enlarged, tender orange-sized tumor behind left broad ligament. Diagnosis, ectopic pregnancy. Before celiotomy decidual membrane removed from uterus by curettment. Tube intact, fimbriated extremity free, ovary continuous with gestation sac deep behind left broad ligament, attached to anterior rectal wall by sac and old blood clots. "All indications ovarian gestation present."

ANNING AND LITTLEWOOD: Celiotomy for ruptured ectopic pregnancy, two pints blood clots. Small ovum found which fitted into firm envelope of laminated clots. Rent in right ovary leading to cavity containing blood into which ovum and sac exactly fitted, clearly indicating primary ovarian origin of the gestation.

BANDEL: Patient died of angina Ludovici. Necropsy, uterus enlarged, uterine decidua present. Both tubes inflamed, occluded, right-sided oöphoritis. At site left ovary tense, brownish-red egg-shaped tumor, left tube not attached to mass. Tumor contained chocolate brown blood, showed positive indications of pregnancy. Primordial follicles and other evidences of ovarian tissue in sac wall, corpus luteum present. "Salpingitis must have closed outer end of tube after passage of the spermatozoon."

FRANZ: Five weeks after menstruation severe pelvic pain, headache, confined patient to bed one week; there was no hemorrhage. Two weeks later pain recurred accompanied by hemorrhage, which persisted until date of operation. Celiotomy, tube normal, site of ovary occupied by hemorrhagic tumor which had ruptured at two points. Gestation four or five weeks development; immediately around ovum few small groups decidual cells.

THOMPSON: For last seven years more or less pelvic pain. Celiotomy, dark red tumor size horse chestnut sprang from left ovary, rupture had not occurred, proved to be ovarian gestation sac, tube normal. Fetus thirty days growth, no trace of amnion, follicle pregnancy.

DE LEON AND HOLLEMAN: Amenorrhea six weeks, four months later pelvic pain and hemorrhage. Celiotomy, tumor formed entirely of ovary, tube normal, no corpus luteum, probably follicle gestation. No fetus found, but many villi present. In wall of fetal sac, cells belonging to *theca interna.*

FUTH: Author described what he then considered the twenty-first example of proven ovarian gestation. The ovary participated in formation of the fruit-sac, which was connected with the uterus by the utero-ovarian ligament. There was complete freedom of the corresponding tube, including the *plica infundibulo-ovaralis.* A lithopedion was found on the opposite side of the abdomen.

MICHOLITSCH: Right salpingo-oöphorectomy per vaginam, ovarian tumor size of apple. On section hematoma size of hazelnut found in smooth lined cavity. Capsule of hematoma showed ovarian tissue and chorionic villi.

IBID: Missed one menstrual period, four weeks later irregular hemorrhage. Left salpingo-oöphorectomy per vaginam, tumor partially torn loose from attachments during operation, but had been attached to utero-ovarian ligament. Definite ovarian tissue and chorionic villi in gestation sac; fetus not found.

BOESBUCH: Irregular menstruation, probable ectopic gestation, no decidua passed. Celiotomy, parovarian cyst, corresponding ovary twice normal

size and ruptured. Villi found at point of rupture, syncytial cells discovered in various portions of ovisac wall.

FREUND AND THOME: (See detail report): Amenorrhea three months, then uterine hemorrhage, sacral and pelvic pain; uterus enlarged, freely movable; to right ovoid tumor size of orange. Celiotomy, pelvis contained considerable quantity sero-sanguineous fluid. Tumor, enlarged right ovary, on blood infiltrated surface multiple follicle-like projections; tube entirely free. Small dead fetus; outer layer gestation sac ovarian tissue.

HEWETSON AND LLOYD: Six weeks after last menstruation severe pelvic pain and collapse, following day blood and shreds *per vaginam*. Celiotomy, large amount dark colored fluid in peritoneal cavity; uterus enlarged. Pregnant ovary was represented as a rounded plum-colored mass; small amniotic cavity. (This patient was sent to hospital with diagnosis of subacute appendicitis.)

KELLY AND MCILROY: Had not menstruated six weeks, severe pain both iliac regions, hemorrhage following day. Two weeks later, diagnosis extra-uterine gestation. Celiotomy, unruptured hemorrhagic cyst size large plum sprang from left ovary, tube normal. Left ovary twice normal size; gestation sac extremely thin, no fetus found; well developed corpus luteum. Entire gestation sac, ovarian tissue.

JACOBSON: Missed one menstrual period, four days thereafter uterine hemorrhage and pain, passed fragment whitish in color, size of walnut. Diagnosis ectopic gestation. Celiotomy, oöphorectomy and partial salpingectomy, ovary represented by rounded mass, near center small cavity containing embryo.

SCHICKELE: Amenorrhea two months, then irregular hemorrhage lasting three days, no pain nor collapse. Celiotomy, tube normal, gestation sac ruptured, large "pelvic hematocele" in which were found chorionic villi and amniotic remains.

WEBSTER: Missed one menstrual period, severe abdominal pain, following day blood and shreds per vaginam. Celiotomy, half ounce dark fluid in utero-vesical pouch. Small ovarian tumor irregularly rounded, slightly adherent to adjacent structures, amniotic cavity in center of mass; tube normal.

IBID: One menstrual period missed, irregular bleeding became profuse, patient confined to bed; uterus normal in size. Celiotomy, right ovary converted into rounded dark-colored tumor adherent in Douglas cul-de-sac, surface lobulated. In center of ovarian tumor small ovoid cavity lined with amnion and containing fluid; tube normal. Fetus attached to wall of cavity.

KERR: Last menstruation November, missed December; in January two attacks pain. Diagnosis ectopic gestation. Celiotomy, January 13th, uterus enlarged, two pints dark blood in peritoneal cavity; right tube and ovary excised. Tube slightly enlarged, hemorrhagic, rupture had occurred; large corpus luteum present. The ovum was found, amniotic cavity small; follicle pregnancy. Two hundred and seventy-six days after last menstruation, viz., August 19th, the patient gave birth to healthy full term child. The author believes the intra- and extra-uterine pregnancies began at the same time.

NORRIS AND MITCHELL: One menstrual period missed, week later irregular hemorrhage, abdominal pain, characteristic of ectopic gestation. Celiotomy, considerable free blood in peritoneal cavity, ovary enlarged; tube normal. Springing from interior surface of ovary gestation sac, outer covering continuous with *tunica albuginea*. In center of ovisac was amniotic cavity. Ovary unusually vascular, center occupied by large *corpora albicantia*. Between ovisac and ovary large corpus luteum; no fetus found.

NORRIS: Last menstruation March, each month thereafter until August "slight show." In August profuse hemorrhage three days, menses irregular until October, then ceased. No pronounced pain any time. Uterus enlarged, deviated to right, left central portion abdomen occupied by irregular mass reaching nearly to umbilicus separated from uterus by distinct groove. Celiotomy following February, left ovary gestation sac size of orange, ruptured, fetus macerated, five months' development. Tube normal; sac contained placenta and membranes.

KIRCHNER: Tumor noted right ovarian region, which as pregnancy advanced, was pushed toward left. Fetal movements fifth month. Celiotomy, tumor resembled ovarian cyst, contained full term healthy fetus which was easily resuscitated. Left tube free, right incorporated with outer surface of gestation sac; ovarian ligament connected with gestation sac which contained placenta and fetal membranes.

MACDONALD: Missed one period. Four hours after development of symptoms indicating rupture of ectopic gestation, celiotomy revealed pelvis filled with blood clots, no active hemorrhage. Right ovary soft, collapsible, three times normal size, "hollowed out from above" so that only thin layer ovarian tissue remained to form sac wall. Cavity within ovary contained small clot, after removal of which slight oozing noted.

BALLERAY: Two weeks after regular menstruation, irregular discharge of blood. Interval of month with no hemorrhage then recurrence with intense pelvic pain, distension and vomiting. Celiotomy, four months' fetus; exterior of sac ovarian tissue.

RUBIN: Sharp radiating pain right side; chilly sensations, fever, weakness, leucorrhea, abdomen tympanitic; tenderness left side. Uterus enlarged, on left small tender mass. Diagnosis, probable ectopic gestation. Celiotomy, uterus non-pregnant size, left tube bent upon itself, attached to ovarian mass, adherent to broad ligament near uterus. Left ovary edematous, chocolate-brown irregular (protruding) surface, considered degenerated *corpus luteum verum*. Small plum-colored mass (hazelnut size) free in pelvis. Site of gestation left ovary which was attached to uterus by proper ligament.

PRINCE: Last menstruation June, nausea, fainting spells. In August slight return of menses, pelvic pain. In November violent fetal movements, uterine hemorrhage. Following February move-

ments more pronounced, hemorrhage, clots and "pieces of flesh" being passed. Irregular nodular tumor occupied entire pelvis. Diagnosis, dermoid cyst right ovary. Celiotomy, intestines, uterus, right tube and ovary densely adherent. Tumor composed of enormously enlarged right ovary which contained fully developed dead child weighing 7½ pounds.

YOUNG AND RHEA: Embryo found in blood clots contained in tissue corresponding to left ovary. The ovary surrounded by blood clot and connected to no other structure except in normal manner. Ostium of corresponding tube closed; opposite tube showed no disturbance except such as might result from pelvic peritonitis. Blood clot entirely about left ovary, not reaching right tube, and right ovary showed no *corpus hemorrhagicus*.

ADDENDUM.

MALL AND CULLEN: Since completion of the foregoing paper a typical example of "ovarian pregnancy located in the Graafian follicle," has been recorded by Mall and Cullen. Patient, aged twenty-four, unmarried, entered the hospital with history of abdominal pain, symptoms indefinite; provisional diagnosis, appendicitis. Celiotomy (Dr. Finney) revealed abdominal cavity filled with blood; both ducti Fallopii intact; extensive hemorrhage had occurred from rupture of enlarged right ovary which contained impregnated ovum. The authors present complete reports covering details of laboratory examinations with excellent photographs of the gross specimen, both before and after section, showing gestation sac (cavity, containing blood clot and villi, lined with layer of lutein cells) and situation of ovarian rupture; also several microphotographs illustrating the more intricate laboratory findings, all tending to conclusively prove the presence of primary ovarian gestation; the spermatozoon evidently entered the Graafian follicle immediately after rupture and fertilized the ovum before its extrusion therefrom.

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VARIATIONS OF APPENDICITIS

It is interesting to note the great degree of certainty with which one can predict the anatomical position of the appendix in several positions. Lumbar pain with a history of repeated fleeting abdominal pains since childhood is quite certain to mean a congenital lesion. In these cases there is a short mesoappendix, or the appendix is largely or sometimes entirely behind the peritoneum, extending far up behind the cecum and ascending colon, thus bearing a close proximity to the lumbar muscles. These cases resemble ureteral calculi and sacroiliac disease. Then, again, when the appendix is close to the bladder or attached to it, bladder symptoms are prominent.—GEORGE W. CRILE in the *Pennsylvania Medical Journal.*

TWO CASES OF UNUSUAL COMPLICATIONS FOLLOWING CRIMINAL ABORTION.*

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Complications following criminal abortion are of frequent occurrence; and they are so far-reaching in their varied pathology that they are much dreaded by every physician called upon to treat them.

It is not my purpose to offer anything new, nor to call attention to the many dangers and the varied complications following in the wake of these operations, for they are all too familiar. I desire, rather, to place upon record two cases of unusual complications, each of which required the most serious operation to save the patient's life; also, to make some suggestions looking to early surgical intervention, such as vaginal section and drainage in those cases of infection in which the uterus has been perforated, and the early drainage of pus accumulation, with the hope of avoiding more serious complications later.

I am convinced from my experience in the management of a large number of these cases, that early vaginal section and free drainage will not only save many lives and shorten the period of convalescence, but will also prevent more serious complications, which will certainly follow if pus accumulation is left to be taken care of by Nature's process.

CASE 1. Mrs. O. L., age 32, mother of one child, was seen June 9, 1906, in consultation with Dr. C. E. Van Meter, who had been called to take charge of the case the preceding day. Inquiry elicited the following history: Menstruation was established when the child was five months of age. The second period came six weeks later; the next in five weeks after that date. When the menses did not again recur at the expected time, the patient, fearing that she was pregnant, used domestic remedies for several days to bring it on, without success. The patient was a frail, poorly nourished, small woman, the wife of a laboring man, and did not want another child. She went to a doctor whom her neighbors told her performed abortions. The patient said that he used an instrument inside of the uterus and her description of it was that of a uterine probe. She made four or five visits to his office at intervals of four or five days. At each visit the doctor used the same instrument, but the patient said he did not cause much pain, until the last visit, on March 5th, when he told her that he was going to use more energetic treatment, and it would surely bring on her period. This treatment caused great pain and she had great difficulty in reaching her home, which was a mile or more from the doctor's office by street car. Arrived home, another physician was called and found her in collapse. But he was kept in ignorance of the fact that she had consulted or been treated by the abortionist. The patient developed a general peritonitis of a severe type and for many days her life was despaired of. Two or three days after the peritonitis commenced, she informed her physician of having consulted the abortionist, and asked him why she had not aborted. Nor at any time during the subsequent illness did the patient abort. The subsequent history of the case proved that she was not pregnant at the time she visited the abortionist, and that he perforated the uterus and infected her in his manipulations. These people were like many in the city, and when they found that the patient did not recover quickly, they discharged their doctor after three or four weeks and sent for another one. This second physician treated the patient for a few weeks and he was likewise discharged. Several physicians had been in attendance and several consultations had been held over the patient. The last was a few days before the case was seen by me. At that time the specialist, who is one of the leading men in our city, is reported to have stated that the patient had a large ovarian tumor, and that she also had sepsis, but her condition was so desperate that an operation was not to be thought of at that time.

After this report the husband discharged both physicians and called Dr. Van Meter. The patient's condition at that time was desperate, for she had been confined to her bed with sepsis for fourteen weeks. She was greatly emaciated, having a chill every day or two, followed by profuse sweats, her pulse was feeble and rapid, often reaching 160 and 170 after her chill, with a temperature from 101° or 102° to 104° or higher. The abdomen was as large as that of a woman at full term, and appeared much larger in her emaciated condition. By every physical sign, one would be justified in saying the enlargement was due to an ovarian tumor. Resonance could be elicited in two small areas only; one over the hypograstic region, 1½ inches by 3 inches, the other in the left lumbar region, 1½ inches by 2 inches. We doubted the presence of a cyst. The contour of the abdomen with the patient on the back was more flattened out than is usual in ovarian cyst. The history was that of infection and it was more probable that the fluid was in the abdomen than in a cyst. We advised operation, as that promised the only hope.

The operation was performed at the Bethesda Hospital, June 11, 1906. An abdominal section was made and 2½ gallons of thin, yellow pus were evacuated. After the abdominal cavity had been cleansed, a most interesting condition was observed; all of the intestinal coils were adherent together and to the posterior wall, and not a single inch of the intestinal tract could be recognized as such. The uterus had been lacerated at the fundus from one horn to the other, and in this rent there was lodged the great omentum, which was now greatly thickened. The omentum was not adherent to any of the viscera or to the abdominal wall. The only operative procedure inside of the abdomen was the

*Read by title at the meeting of the Southern Surgical and Gynecological Association, Atlanta, 1913.

ligation of the proximal side of the omentum and dividing it close to the fundus of the uterus. After lifting the omentum up, with the greatly relaxed abdominal wall, we could better inspect the cavity, and then could be observed slight elevations representing the intestinal coils. There was no pelvic cavity, but the fundus of the uterus was projected into the abdomen ½ or ¾ of an inch above the surrounding tissues. The whole abdominal cavity was thus a huge pus sac, which was flushed with very warm normal saline solution and closed with drainage.

It was remarkable how the operation benefited the patient. The chills did not recur, the pulse improved, the temperature did not run so high, and when it did rise it remained up for but a short time. The patient improved as well as one could ask from the hour of the operation. She took liquid nourishment only but freely and with a relish. On the second day she passed flatus freely and had a good bowel movement on the third day, and one on the fourth day following the operation. She felt fine on the fifth day, also on the sixth day, June 17th, until the evening of that day. In the night she complained of pain in the abdomen and was unable to pass any flatus at all. The patient had complete obstruction of the bowels from that date until 9 P.M. June 23rd, a period of six days. She had regurgitant and fecal vomiting on June 18th. From our knowledge of the condition of the intestinal tract, I felt certain that the treatment could not be surgical. I could not conceive how one could hope to sucessfully deal with the obstruction if the abdomen was reopened. For that reason conservative treatment was adopted. We resorted to frequent lavage of the stomach, withholding all nourishment from the mouth, with rectal feeding and hypodermatic medication as indicated. The evening of the sixth day of obstruction, the abdomen was greatly distended, yet the patient appeared to be holding her own for the past three days. The pulse and temperature both were much more satisfactory than before the operation. The family and friends were clamoring for some kind of an operation to relieve her, because the previous operation did so much. We urged no operative interference, believing that by an operation we would certainly take away any chance she might have. Besides, nature might be able to right the difficulty. In the evening of that day she was able to pass flatus, and within a few hours the abdominal enlargement was greatly reduced and the patient was taking albumen water freely and retaining it. From that date she convalesced slowly but steadily, and was able to leave the hospital on July 9th, twenty-eight days after the operation. She gradually regained her health, and at the end of seven months she had resumed her usual weight and strength. It is now seven years since the operation. The uterus and ovaries are fixed in the pelvis and she remains sterile.

The case is interesting and unique in my experience in that class of cases in which the uterus has been perforated in attempts at abortion, in that the patient could survive from infection with pus in the pelvis for so many months, which gradually increased in quantity until the abdomen became so large that it simulated a large ovarian tumor; and in that she should have complete obstruction for six days and yet nature should again assert its powers in her behalf,—a treatment, however, that I would hesitate to recommend for obstruction ordinarily following operation. It is the only case to recover so treated that I have any knowledge of. This recovery can be accounted for by the intestinal tract being so fixed by the inflammatory process as to prevent sharp angulation of the canal when it became distended by gas.

Case 2. Referred by Dr. Chas. Belt, Batavia, Ohio, February 3, 1913, after an illness of more than two years. The following is a condensed history of the case, giving only the more important points up to the time of that visit. Mrs. T., age 38, one child, aged 12 years. In January, 1911, the patient had an abortion followed by severe infection and peritonitis. She was very sick for many weeks, with high temperature, great abdominal distension, and irregular chills, followed by profuse perspiration. About ten weeks after the infection, there was a free discharge of pus (estimated to be a pint or more) from the patient's bladder. From this time her condition slowly improved. The urine contained a large amount of pus, varying from three to eight ounces in twenty-four hours. The bladder soon became very irritable and caused great suffering from the constant tenesmus. About eight weeks after the first discharge of pus and about eighteen weeks after the infection, the patient's condition was much improved. The abdominal distension was greatly reduced, and the pain in the pelvis and the abdomen had about disappeared. The chills did not recur so often; the discharge of pus was less and the sweats were not so profuse. The patient was able to be propped up in bed and was comparatively comfortable, excepting the constant bladder tenesmus. After a few days of this apparent convalescence, the pus almost entirely disappeared from the urine. Within two or three days the pain in the pelvis and abdomen returned. The temperature and pulse rose and the sweats again became very profuse, with complete loss of appetite. The patient was again very ill. All of the severe symptoms continued for eight or ten days, when the abscess again discharged a pint or more through the bladder. This was followed almost immediately by relief. The patient improved rapidly and within a week or so was again able to sit up. The convalescence appeared to be satisfactory, excepting that there was a great quantity of pus in the urine and the bladder tenesmus was very distressing, preventing the patient from securing much sleep. She was now able to be up a part of each day. This improvement continued for a period of about seven or eight weeks, when the pus again almost entirely disappeared from the urine. Within a day or two all of the old symptoms returned, showing the effect of pent-up pus. She was again very ill for a period of eight or ten days, when the abscess again emptied itself into the bladder. This was followed by prompt relief of all

of the severe symptoms and general improvement. In about five or six weeks, menstruation was established for the first time since the illness commenced, more than eight months before. The flow continued five days. She menstruated irregularly afterwards, about every three to eight weeks. The duration of the periods varied from five to seven days, the normal period being three to four days. The patient was able to be up most of the day and direct her household duties. Up to the time of the last relapse, which occurred about January 20, 1913, the history of the case was a repetition of that given above. While the abscess was discharging freely, the patient's condition was bearable, yet she was septic at all times. Once every six, seven or eight weeks, the opening would close, to be followed by a week or more of fever, pain and severe illness, until it again discharged its contents into the bladder. The last attack did not differ from the many which had preceded it, except that the pus contained some fecal matter. The patient recovered from this attack as rapidly as any which had preceded it, except that the bladder tenesmus was greatly aggravated. The feces discharged through the bladder rapidly increased in amount. Her suffering from the bladder tenesmus was so great that she for the first time would consider the repeated urgent advice of her physician to submit to an operation.

At the time of her visit to me, she weighed about ninety pounds, her normal weight being 120. She was very feeble and was just up a few days from her recent relapse. At the time of the examination, the patient said that since her first illness she always had pain in the right side of the pelvis and abdomen, and the urine contained a large amount of pus, excepting during her acute attacks, at which time it was greatly reduced. The urine now contained a large amount of pus and bowel contents. Examination revealed the uterus slightly enlarged, pushed to the left side of the pelvis, and fixed, with a large mass at the right, which, with the uterus, filled the pelvis full, and extended some three inches above the pubic arch. The right kidney was below the border of the ribs and was more than twice the normal size. The left kidney could not be palpated. A cystoscopic examination revealed the bladder contracted and very much inflamed. The left ureteral opening could be easily located, discharging normal urine into the bladder. Near to and in front of the right ureteral opening was a tumor mass as large as the end of the index finger, which proved to be the opening into the bowel and abscess cavity. The right ureteral opening could not be located, which was much regretted, on account of the enlarged kidney on that side. But inasmuch as the kidneys were secreting almost or quite the normal amount of urine, an operation was advised and made the following day.

Upon opening the abdomen, there were no adhesions to the abdominal wall. The pelvic cavity and the lower right side of the abdomen were filled with a mass that included the bladder, uterus, and several coils of small intestines. The fingers could be passed to the left of the uterus, down to the pelvic floor, there being no adhesions on that side. No ovary could be detected. The uterus and the tumor in the right side filled the pelvic cavity. On the top of these were the great mass of adherent coils of intestines. These were separated from the uterus and bladder, inspected, wrapped in gauze and laid aside. The tumor, which proved to be a pus tube and suppurating ovary, with a perforated appendix, was removed. The bladder was liberated from its adhesion to the anterior wall of the uterus, and found to be greatly thickened, with a hole in it through which the thumb could be easily passed. The opening in the bladder, owing to the greatly thickened condition of the bladder wall, was closed very imperfectly with catgut. Turning to the repair of the intestine, there was a large opening into the mass of adherent bowel, through which the finger could be passed. In separating the different coils, four in number, each was found to have an opening at the point of attachment to the bladder. These openings were separated from each other distances of about twelve to eighteen inches. There was also a large ragged hole in the head of the colon. These were repaired by suture of Pagenstecher's linen. The right kidney was examined and nothing abnormal could be detected, excepting its greatly increased size. The left kidney was normal in size. As mentioned before, there were no adhesions on the left side. There was also a complete congenital absence of the left ovary and tube. It is unusual to have a pelvic abscess open into the bladder. This is the first case that I have observed. The patient had a slow but satisfactory convalescence. She has regained her former weight and strength, and excepting the usual reflexes of the menopause, is enjoying excellent health.

These cases are interesting as illustrating in a marked degree the tenacity to life in some cases of infection. They also emphasize the serious and dangerous complications arising in these infectious cases, where accumulations of pus are left to nature in place of being treated by modern surgical methods.

There is no question but that it requires good surgical judgment in the management of infection following abortion, to decide which one should be drained and which one should not be, especially these cases of criminal abortion. In many cases, the patient uses various instruments upon her own person, and not infrequently perforates the uterus in her attempts at abortion, and the danger of infection is very great. Also, I am convinced that not infrequently do professional abortionists perforate the uterus in their attempts at abortion.

In the treatment of this class of cases in my public hospital work, as well as cases seen in private practice, for years I have frequently made vaginal section and drainage. In those cases of infection in which we suspect that the uterus has

been perforated, and especially if there is an accumulation of peritoneal fluid in the pelvis, the drainage should be established early, not waiting for the formation of pus. In all cases that do not progress satisfactorily after a period of six or eight days from the commencement of the infection, drainage should be considered and the case watched carefully for a pelvic accumulation, and if that occurs, drainage should be established at once. In not a few cases three or four weeks may elapse from the time of the infection before the accumulation of fluid or pus formation can be made out, but as soon as it can be done drainage should be established. If case No. 1 in the report had been subjected to a vaginal drain within a week or so after her last visit to the abortionist, she would probably have made a prompt recovery after a short convalescence. If case No. 2 had had a vaginal section made three or four weeks after her first infection, she would likewise have recovered with a comparatively short convalescence.

RECTO-SIGMOIDAL CANCER.

The radical cure of carcinomata of the rectum has a bad name in surgery, which is due more to inefficient methods of operation and purely sentimental attempts to conserve function than to the character and location of the disease. We are coming to the conclusion that a permanent colostomy in the middle of the left rectus muscle should be made as the primary operation in the majority of cases of carcinoma of the ampulla of the rectum, and at a second operation, after the lower segment has been properly cleansed, the entire rectum should be removed from behind. This method offers the patient moderate control, with the best chance of a permanent cure.

High rectal and rectosigmoid growths will often be best approached through the abdomen or by *the combined method. The perineal operation* should be reserved for growths in the anal region.

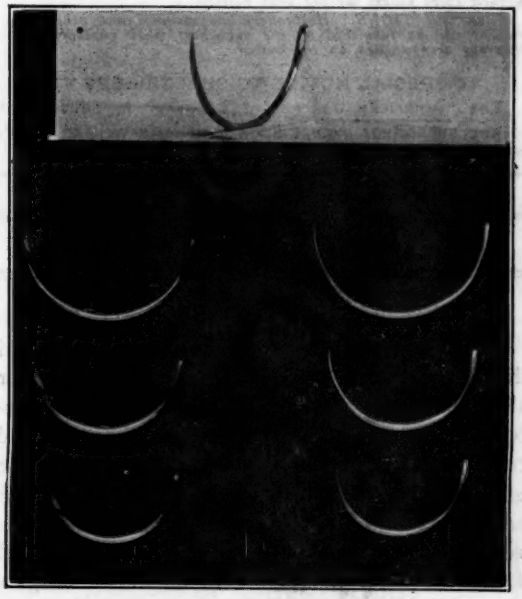
The frequency with which secondary carcinomata of the liver, peritoneum or inoperable glandular involvement occur, makes it imperative in all cases o carcinomata of the rectum and rectosigmoid to first open and thoroughly explore the abdomen to see whether the case is one which should be submitted to operation; and, if advisable, a permanent colostomy can be made at this time.—WM. J. MAYO, in *The Journal-Lancet.*

AN IMPROVED SURGICAL NEEDLE.

CHARLES ALFRED DUKES, M.D.,
Chief Surgeon, Gynecological Staff, The Samuel Merrit Hospital, March to September; Chief Surgeon, National Guard of California.
OAKLAND, CAL.

These needles have the following features:

The eye is large enough to be easily threaded with large suture material, is grooved to take care of the doubling of the material, and is not any larger than the shaft of the needle,—hence there is no tearing or cutting of tissue.



They are made of steel which bends but does not break, and is not plated.

They are made in round non-cutting edge, and with spear point.

They can be grasped close to the eye without danger of breaking, and they will not turn in a needle holder if firmly held at this point.

In injuries and infections of the thumb make especial effort to preserve as much of it as possible. Even a stump of thumb is valuable, and a thumbless hand is sadly crippled, indeed.

The x-ray shadow of a calcareous deposit seen in cases of subacromial (subdeltoid) bursitis is not in the bursa, as commonly supposed, but in or on the supraspinatus tendon, the lesion in which causes the bursitis.

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, MAY, 1914.

THE FATE OF THE SURGEON.

The medical sciences have become so amplified that no individual any longer attempts to master all of their branches. Medical practice has now become a matter of team-work. In the diagnosis and treatment of a surgical disease, the patient, who can afford it, has the advantage of several experts in several specialties. The family physician once represented all of the skill—both medical and surgical. Later the surgeon represented all of the surgical skill. Now the surgeon shares it with other specialists having to do with surgery.

The radiographist, the gastro-enterologist, the urologist, the bacteriologist, and all of the specialists at times perform services which the patient needs and which the surgeon cannot perform. Besides these there are the nurse, the historian, and the anesthetist—all important adjuncts. Moreover, while the dividing line between surgical and medical *diseases* is being more clearly defined, the dividing line between surgical and medical *patients* scarcely longer exists. As a nearer approach to perfection in the treatment of surgical diseases is attained, more and more attention is given to the whole patient, who is now regarded as a community of organs with various disorders and possibilities of disorder, all more or less intimately correlated to the surgical disease. The best results in surgical works are attained when these facts are reckoned with.

While this trend in the development of surgery is of importance from the scientific standpoint, it has also a significant relation to the economics of our art. It is developing at a time when there is a strong urge towards the larger social application of all useful knowledge and skill. So long as the various scientifically coordinated specialties remain economically separate business enterprises, defeat of their best possibilities is invited. Their highest sphere of usefulness can be attained only by their economic as well as scientific coordination.

This means that either the members of the medical profession must go into partnership with one another or that they must go into partnership with the public. Either economic competition must fall in line and give place to economic cooperation, just as we now have scientific cooperation; or the public must confiscate the medical profession as it is now proceeding to do in England. The surgeon must syndicalize himself or the public is going to socialize him. One or the other of these is inevitable. Either is to be preferred to the present competitive system in which both surgeon and patient are the victims of economic maladjustment.—J. P. W.

THE REMOVAL OF THE APPENDIX IN APPENDICULAR ABSCESS.

We were much interested, and rather surprised, to learn from a recent article by Van Buren Knott (*Journal of the A. M. A.*, March 28th) that the practice is still very common among surgeons of merely draining appendicitis abscesses without removing the offending organ. We agree with Knott that this insufficient surgery is not good practice. It usually involves the necessity of a second operation, often preceded by debilitating sinus suppuration; and, rather than avoiding danger, it invites it. The policy of leaving the appendix is based, no doubt, on the fear that by separating "protecting" or "walling-off" adhesions in the effort to remove it, infection will be spread to the uninvolved peritoneum. This is an old fear inherited from the earlier methods of dealing with appendiceal suppuration, and quite abandoned, we thought, by experienced surgeons. Repeated observations quite justify the opposite stand, viz., that the most important step in the prevention or cure of suppurative peritonitis is the immediate removal of its possible focus. Moreover, as Knott points out, the exposure of the appendix also often reveals other pockets of pus that, unemptied, would have caused serious mischief. The search for and amputation of the appendix is, to be sure, often not a simple matter, but to the experienced surgeon (and no sur-

geon is worthy of the name who has not operated upon a great many such cases) it presents no technical difficulties or terrors.

To be sure, occasionally one encounters a case in which the local conditions and the patient's general condition suggest the wisdom of leaving a search for the organ for a subsequent procedure. These are the exceptions which even the most skilful operators will recognize and respect. The inexperienced operator, called upon in an emergency, for example, to relieve an appendicitis abscess, or encountering a condition beyond his technical ability, will, of course, by doing the greatest justice to his patient by contenting himself with thorough drainage.

As a surgical principle, for routine application, the important consideration in the operation for appendicular suppuration—localized or diffuse—is the removal of the gangrenous or perforated appendix after wiping or emptying away the pus.—W. M. B.

THE MEETINGS OF THE AMERICAN AND INTERNATIONAL SURGICAL ASSOCIATIONS.

A unique and interesting occasion was the annual meeting last month of the American Surgical Association and, immediately after it, the fourth triennial congress of the International Surgical Association (the first held outside of Belgium), both at the Hotel Astor, New York. Essentially this was a joint meeting, for many of the hundred or more eminent European surgeons attended or took part in the meeting of the American Surgical Association (April 9 to 11), and the latter organizations actively participated in, and was host of, the international congress (April 13 to 16). Numerous hospital clinics added much to the interest of the visitors.

The subjects discussed at the two meetings were not numerous, but, as might be expected, the papers read were of high order and were discussed actively. The contribution that made the most profound impression was Erich Lexer's studies and clinical experiences in transplantations.

We have thought these combined meetings of so much interest that we have prepared a brief report of them, which will be found in this issue, on page 206.—W. M. B.

JOSEPH D. BRYANT.

A solemn incident marked the first day's session of the American Surgical Association—its attendance, in a body, at the funeral of its late member, Joseph D. Bryant, for many years professor of surgery at the Bellevue Medical School and Surgeon to Bellevue Hospital, New York.

Dr. Bryant was more than an eminent surgeon and an admired teacher. He was an organizer and a respected councillor in hospital, university, medical association, military and public health affairs, vigorous, upstanding and broad-spirited. A mere list of the offices he had held, in addition to his academic and clinical positions, will indicate the breadth of his interests and the respect he inspired in their pursuit: President of the N. Y. Academy of Medicine, of the N. Y. State Medical Association, of the Medical Society of the State of New York, of the American Medical Association; Health Commissioner of the City of New York, and of the State of New York; Surgeon-General (Brigadier-General) of the National Guard of the State of New York. Dr. Bryant was a national figure, as the close friends and medical adviser of President Cleveland and, on his own account, for the vigorous manner in which as State Health Commissioner in the early nineties, he stopped a threatened importation of cholera that had alarmed the whole country.

Two large works especially mark Dr. Bryant's contributions to American medical literature, his excellent two-volume treatise on Operative Surgery and the eight-volume System of Surgery which he edited with Prof. Albert Buck.—W. M. B.

Surgical Suggestions

The risks of pylorectomy can be reduced by performing it in two stages—first the gastro-enterastomy, later the resection.

In cellulitis of the fingers, avoid if possible, incisions over the tendons which, by exposing them, encourages their destruction.

When amputating an infected finger or toe it is very desirable to snugly ligate each tendon, sheath and contained tendon to prevent the entrance of infection into them.

Acute flexion is the best position in which to dress elbow fractures through the humerus. Care must be taken, of course, to avoid skin decubites and obliteration of the radial pulse. *Early* passive motion is highly important.

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

THUMBS AND WORKMEN'S COMPENSATION ACTS.

Among the most characteristic features of the human being is the development of the hand. To be a handy man requires the possession of all the fingers and both thumbs. The industrial value of an individual is interfered with to a greater extent by the loss of a thumb than by the loss of an eye.

The relative values and importance of the fingers decrease in a direct ratio to their distance from the thumb. It is of interest, in view of the various workmen's compensation acts which have been enacted, to note what consideration has been given to injuries occurring to thumbs and fingers. In many of the laws no specific compensation is given for particular fingers of thumbs, but the compensation is given for total injury of the hand. There are various rules existing for compensations for the loss of a phalanx or even or two phalanges. The difference in values of the thumbs and various fingers is worth considerable study, not alone from the standpoint of conservative surgery, but also from the standpoint of medical jurisprudence and social legislation.

Without discussing the merits of the various laws that have been enacted, we append a résumé of the compensation for minor disabilities as found in the compensation acts of twelve states where the disabilities and compensations are specifically mentioned.

Connecticut.—For the loss of a thumb, thirty-eight weeks; for the loss of a first finger or a great toe or third finger, twenty-five weeks; a fourth finger, twenty weeks; for the loss of any toe except the great toe, thirteen weeks. The loss of one phalanx of a thumb or two phalanges of a finger shall be considered half the loss of a thumb or finger respectively, and shall be compensated accordingly.

Illinois.—For the loss of a thumb, or the permanent and complete loss of its use, fifty per centum of the average weekly wage during sixty weeks.

For the loss of a first finger, commonly called the index finger, or the permanent and complete loss of its use, fifty per centum of the average weekly wage during thirty-five weeks.

For the loss of a second finger or the permanent and complete loss of its use, fifty per centum of the average weekly wages during thirty weeks.

For the loss of a third finger, or the permanent and complete loss of its use, fifty per centum of the average weekly wage during twenty weeks.

The loss of a fourth finger, commonly called the little finger, shall be considered to be equal to the loss of one-half of such thumb, or finger, and compensation shall be one-half the amounts above specified.

The loss of one phalanx of the thumb, or of any finger, shall be considered to be equal to the loss of one-half of such thumb, or finger, and compensation shall be one-half the amounts above specified.

The loss of more than one phalanx shall be considered as the loss of the entire finger or thumb; provided, however, that in no case shall the amount received for more than one finger exceed the amount provided in the schedule for the loss of a hand.

Iowa.—For all cases included in the following schedule compensation shall be paid as follows, to-wit:

(1) For the loss of a thumb, fifty per cent of daily wages during forty weeks.

(2) For the loss of a first finger, commonly called the index finger, fifty per cent of daily wages during thirty weeks.

(3) For the loss of a second finger, fifty per cent of daily wages during twenty-five weeks.

(4) For the loss of a third finger, fifty per cent of daily wages during twenty weeks.

(5) For the loss of a fourth finger, commonly called the little finger, fifty per cent of daily wages for fifteen weeks.

(6) For the loss of the first phalanx of the thumb or of any finger shall be considered to be equal to the loss of one-half of such thumb or finger, and compensation shall be one-half of the amounts above specified.

(7) The loss of more than one phalanx shall be considered as the loss of the entire finger or thumb; provided, however, that in no case shall the amount received for more than one finger exceed the amount provided in this schedule for the loss of a hand.

Massachusetts.—For the loss by severance at or above the second joint of two or more fingers, including thumbs, or toes, one-half the average weekly wages of the injured person, but not more than ten dollars nor less than four dollars a week, for a period of twenty-five weeks.

Michigan.—For the loss of a thumb, fifty per centum of the average weekly wages during sixty weeks.

For the loss of a first finger, commonly called index finger, fifty per centum of average weekly wages during thirty-five weeks.

For the loss of a second finger, fifty per centum of average weekly wages during thirty weeks.

For the loss of a third finger, fifty per centum of average weekly wages during twenty weeks.

For the loss of a fourth finger, commonly called little finger, fifty per centum of average weekly wages during fifteen weeks.

The loss of the first phalanx of the thumb, or of any finger, shall be considered to be equal to the loss of one-half of such thumb or finger, and compensation shall be one-half the amounts above specified.

The loss of more than one phalanx shall be considered as the loss of the entire finger or thumb; provided, however, that in no case shall the amount received for more than one finger exceed the amount provided in this schedule for the loss of a hand.

Nevada.—For the loss of a thumb, fifty per cent

of the average monthly wages during fifteen months.

For the loss of a first finger, commonly called the index finger, fifty per cent of the average monthly wages during nine months.

For the loss of a second finger, fifty per cent of the average monthly wages during seven months.

For the loss of a third finger, fifty per cent of the average monthly wages during five months.

For the loss of a fourth finger, commonly called the little finger, fifty per cent of the average wages during four months.

The loss of more than one phalanx shall be considered as the loss of the entire finger or thumb; provided, however, that in no case shall the amount received for more than one finger exceed the amount provided in this schedule for the loss of a hand.

New Jersey.—For the loss of a thumb, fifty per centum of daily wages during sixty weeks.

For the loss of a first finger, commonly called index finger, fifty per centum of daily wages during thirty-five weeks.

For the loss of a second finger, fifty per centum of daily wages during thirty weeks.

For the loss of a third finger, fifty per centum of daily wages during twenty weeks.

For the loss of a fourth finger, commonly called little finger, fifty per centum of daily wages during fifteen weeks.

The loss of the first phalanx of the thumb, or of any finger, shall be considered to be equal to the loss of one-half of such thumb, or finger, and compensation shall be for one-half of the periods of time above specified, and compensation for the loss of one-half of the first phalanx shall be for one-fourth of the periods of time above specified.

The loss of more than one phalanx shall be considered as the loss of the entire finger or thumb; provided, however, that in no case shall the amount received for more than one finger exceed the amount provided in this schedule for the loss of a hand.

New York.—For the loss of a thumb, sixty weeks.

For the loss of a first finger, commonly called index finger, forty-six weeks.

For the loss of a second finger, thirty weeks.

For the loss of a third finger, twenty-five weeks.

For the loss of a fourth finger, commonly called the little finger, fifteen weeks.

The loss of the first phalanx of the thumb or finger shall be considered to be equal to the loss of one-half of such thumb or finger, and compensation shall be one-half of the amount above specified. The loss of more than one phalanx shall be considered as the loss of the entire thumb or finger; provided, however, that in no case shall the amount received for more than one finger exceed the amount provided in this schedule for the loss of a hand.

Ohio.—For the loss of a thumb, 66 2/3% of the average weekly wages during sixty weeks.

For the loss of a first finger, commonly called index finger, 66 2/3% of the average weekly wages during thirty-five weeks.

For the loss of a second finger, 66 2/3% of the average weekly wages during thirty weeks.

For the loss of a third finger, 66 2/3% of the average weekly wages during twenty weeks.

For the loss of a fourth finger, commonly known as the little finger, 66 2/3% of the average weekly wages during fifteen weeks.

The loss of the second or distal phalanx of the thumb shall be considered to be equal to the loss of one-half of such thumb; the loss of more than one-half of such thumb shall be considered to be equal to the loss of the whole thumb.

The loss of the third, or distal, phalanx of any finger shall be considered to be equal to the loss of one-third of such finger.

The loss of the middle, or second, phalanx of any finger shall be considered to be equal to the loss of two-thirds of such finger.

The loss of more than the middle and distal phalanxes of any finger shall be considered to be equal to the loss of the whole finger; provided, however, that in no case will the amount received for more than one finger exceed the amount provided in this schedule for the loss of a hand.

Oregon.—The loss by separation of a thumb, twenty-four months, or, at the option of the workman, six hundred dollars in a lump sum.

The loss by separation of a first finger, sixteen months, or, at the option of the workman, three hundred fifty dollars in a lump sum; the second finger, nine months, or, at the option of the workman, two hundred dollars in a lump sum; a third finger, eight months, or, at the option of the workman, one hundred and seventy-five dollars in a lump sum; a fourth finger, six months, or, at the option of the workman, one hundred and fifty dollars in a lump sum.

The loss of one phalanx of the thumb shall be considered equal to the loss of one-half a thumb; the loss of one phalanx of a finger, equal to the loss of one-third of a finger, and the loss of two phalanges of a finger, equal to the loss of one-half a finger, and the compensation for the respective proportions of the above period or in the respective proportions of the above lump sum shall be payable. The loss of more than one phalanx of a thumb, or more than two phalanges of a finger, shall be considered as the loss of an entire thumb or finger.

Rhode Island.—For the loss by severance at or above the second joint of two or more fingers, including thumbs or toes, one-half the average weekly wages, earnings, or salary of the injured person, but not more than ten dollars nor less than four dollars a week, for a period of twenty-five weeks.

For the loss by severance of at least one phalanx of a finger, thumb, or toe, one-half the average weekly wages, earnings, or salary of the injured person, but not more than ten dollars nor less than four dollars a week, for a period of twelve weeks.

Texas.—For the loss by severance at or above the second joint of two or more fingers, including thumbs and toes, sixty per cent of the average

weekly wages of the injured employee, but not more than fifteen dollars nor less than five dollars a week, for a period of twenty-five weeks. For the loss by severance of at least one joint of a finger, thumb, or toe, sixty per cent of the average weekly wages of the injured employee, but not more than fifteen dollars nor less than five dollars a week, for a period of twelve weeks.

Book Reviews

Diseases of the Heart. By JAMES MACKENZIE, M.D., F.R.C.P., LL.D., Ab. and Ed., F.R.C.P.I. (Hon.), Physician to the London Hospital (in charge of the Cardiac Dept.); Consulting Physician to the Victoria Hospital, Burnley. *Third edition.* Octavo; 500 pages; illustrated. London: HENRY FROWDE, *Oxford University Press.* HODDER and STOUGHTON, 1913.

It is interesting to compare the present edition with the first, published only five years ago. We find that the work has been almost entirely re-written. This indicates two things: first, that cardiac pathology is undergoing rapid and profound changes; and second, that Mackenzie, who is largely responsible for this newer impulse, still remains in the vanguard of students of cardiac disease. This edition also differs from the previous one in three particulars. First, in the clearer differentiation of the signs of disease. Here the electro-cardiogram has been of great service. Second, the bearing of heart manifestations on cardiac failure. Third, the basing of treatment on sound and scientific principles. There is hardly any need to remind the reader that Mackenzie created a new era in text-books on diseases of the heart. This edition still reveals every attribute of a great text-book, and no better tribute can be afforded it than by declaring it the most authoritative treatise on diseases of the heart in any language.

The Early Diagnosis of Tubercle. By CLIVE RIVIERE, M.D., F.R.C.P., Physician to Out-Patients, City of London Hospital for Diseases of the Chest; Physician East London Hospital for Children. Duodecimo; 260 pages. London: HENRY FROWDE and HODDER & STOUGHTON, 1914. Price $2.00.

Though small in size, an extremely large amount of useful information is contained in Dr. Riviere's book. The author presents in a concise manner all the newer adjuvants used in making an early diagnosis of thoracic tuberculosis, and as he is able to speak from a very large experience, his commentaries and conclusions are worthy of careful note. The largest part of the book is taken up by a consideration of pulmonary tuberculosis in adults and the clinical and special tests used in its diagnosis. The last quarter of the book is devoted to pulmonary tuberculosis in children, especially to disease of the bronchial nodes.

The book is thoroughly up-to-date; subjects such as quantitative cutaneous tuberculin test, albumin reaction of the sputum, Gram-Much staining and pulmonary radiography are all freely discussed. It is not often that the reader gets so clear and well-presented a conception of the subject of diagnosis of tuberculosis, and we believe that this little volume may be most highly recommended.

Diagnosis in the Office and at the Bedside. The Use of Symptoms and Physical Signs in the Diagnosis of Diseases. By HOBART AMORY HARE, M.D., Professor of Therapeutics, Materia Medica and Diagnosis in the Jefferson Medical College of Philadelphia. *Seventh edition,* revised and rewritten. Octavo; 547 pages; 164 engravings and 10 full-page plates. Philadelphia and New York: LEA & FEBIGER, 1914. $4.00, net.

The subtitle of this very practical and excellent work indicates its character. It consists essentially of a description from the diagnostic standpoint, under each symptom or symptom-group, of the affections marked by that symptom or regional lesion. The work follows therefore the mental processes that one actually employs in bedside diagnosis. Laboratory diagnosis is not included, but all the methods of clinical diagnosis are considered in their appropriate applications.

A Synopsis of Medical Treatment. By GEORGE CHEEVER SHATTUCK, M.D., Assistant Physician to the Massachusetts General Hospital. *Second edition.* Duodecimo; 96 pages; interleaved; pasteboard cover. Boston: W. M. LEONARD, 1914. Price $1.25.

This outline of treatment is based on methods that have been employed at the Massachusetts General Hospital. It is a useful condensation or framework.

Progress in Surgery

A Résumé of Recent Literature.

THE MEETING OF THE AMERICAN SURGICAL ASSOCIATION.

New York, April 9th, 10th, 11th, 1914.
President, WM. J. MAYO.
(Next Meeting in Rochester, Minn., 1915;
President, GEORGE ARMSTRONG, Montreal.)

ADDRESSES OF SPECIAL NOTE.

First Day.

THE PROPHYLAXIS OF CANCER was the subject of W. J. MAYO's presidential address. Briefly considered, the points made were as follows:

Local lesions constitute an invitation to the development of carcinoma.

Between benign and malignant growths there are midway lesions in which the cells are changed but there is no invasion of the surrounding tissues.

Local lesions upon which cancer may develop may be divided into three classes:

1. Congenital neoplasms.
2. Trauma. Both carcinoma and sarcoma have been known to develop within a short time after the infliction of a trauma.
3. Chronic irritation. The well-known examples were cited of the carcinoma of the floor of the mouth in the natives of India who habitually carry a mass of acrid betel-nut leaves in this location, and carcinoma of the abdominal wall at the site of burns caused by the Kangri stoves of Thibet.

To these examples of precancerous lesions upon the surface of the body were added analogous examples of lesions occurring in the mucous membranes lining the various hollow viscera. Unfortunately such precancerous conditions give few symptoms.

Gall-stones and carcinoma of the gall-bladder are both frequent in the female. The mortality in operating for gall-stones in early cases is one-half of one per cent. at the Mayo Clinic. There were no cures in the diagnosed cases of carcinoma of the gall-bladder. There were some cures in the early non-diagnosed cases. (Early cancer in thickened sclerosed gall-bladder containing stones.)

Carcinoma of the *stomach.* In animals (rats) it has been observed that carcinoma of the stomach followed the habitual eating of irritating foods (cockroaches), but did not occur in those animals fed with non-irritating substances. In over 50% of the cases of carcinoma of the stomach observed at the Mayo Clinic the history pointed to the existence of precancerous lesions. In civilized man carcinoma of the stomach is a disease whose frequency is steadily increasing. A comparative study of the life habits of civilized and uncivilized men might perhaps shed some light upon the subject. For example, the meat consumption of civilized man has increased five-fold within the last century. (This mark was misconstrued by the reporters to mean that the eating of meat was a cause of cancer of the stomach.)

The comparative immunity of the small intestine to neoplasms was noted. All neoplasms of this part of the gut coming to operation early, were found to originate from pre-existing polyps or similar growths.

New growths of the appendix were found to be associated with pre-existing chronic obliteration.

In those growths of the large intestine coming to early operation pre-existing diverticula could frequently be demonstrated.

Carcinoma of the kidney and the ureter were frequently seen to follow chronic irritation from the presence of stone.

In concluding, special strength was laid upon precancerous lesions and chronic irritation.

It was urged that contrast studies be made with a view to changing deleterious habits. The early removal of precancerous lesions was strongly advised.

THE COLEY'S FLUID TREATMENT OF SARCOMA, especially sarcoma of the long bones, was discussed by its originator. He, as well as many of those who joined in the discussion afterwards, cited cases of sarcoma which had recovered and stayed well for a long period of time, even up to twenty years after the recovery of their existence. Especially interesting were some cases in which the growth at first disappeared, to recur after ceasing the administration of the "toxins", to disappear for a second time after their readministration.

The consensus of opinion was that in only a very small portion of the cases were the toxins observed to be of any use (much less than 1% of the total). Sarcomata has been known to regress spontaneously, although very rarely. Whether the cases which have recovered under the toxin treatment would have gotten well of their own accord cannot be determined. In any case, with such a hopeless prognosis, the toxins should be tried faithfully and for a long time. (The patients frequently become restless under the treatment because of the disagreeable symptoms it gives rise to, such as high fever, chills, general malaise, loss of weight, etc.)

In the session devoted to STOMACH SURGERY and INTESTINAL STASIS, RODMAN, of Philadelphia, again urged the importance of removing the ulcer-bearing area to avoid the dangers of cancer-formation, relapse of symptoms and later hemorrhage. In the discussion it was held that the mortality from cancer-formation after gastro-enterostomy, without pyloric resection, may be less than the difference in the primary mortalities of pylorectomy and the less radical procedure. In support of Rodman, LILIENTHAL, of New York, recommended pylorectomy in two stages as a means of reducing its operative mortality.

STEWART, of Philadelphia, reported a new method of gastro-enterostomy, too technical to describe here.

Second Day.

THORACIC SURGERY. CARREL, of New York, reported his EXPERIMENTAL OPERATIONS ON THE ORIFICES OF THE HEART. The blood flow through the heart of dogs can be safely stopped (by clamps) for two minutes or a little more, which allows enough time for plastic work on the valves. ARMSTRONG, of Montreal, reported a case of auricular fibrillation from foreign body in the pericardium.

REHN, of Frankfort, in discussing Armstrong's paper, advised avoiding injuries to the pleura in exposure of the heart whenever this was possible because of the danger from infection. He advised a mediastinal instead of the intrapleural exposure. After transverse division of the left rectus close to its thoracic attachments, the sternum is split from below upwards as far as is necessary. If the thorax is elastic, vigorous retraction of the divided halves of the sternum will afford sufficient room. If not, the sternum can be transversely divided at the upper end of its vertical division. Among the conditions in which this approach may be useful, are injuries of the heart, the Trendelenburg operation, pericardial plastics, and De-Lorme's operation. Rehn cited an especially interesting case of gunshot wound of the right ventricle in which the longitudinal splitting of the sternum afforded exposure of the wounded heart within a few moments. There was profuse hemorrhage. Manual compression of the superior and inferior venæ cavæ promptly effected hemostasis. The rent in the heart wall was sutured and the patient made an uneventful recovery.

STEWART, of Philadelphia, reported an autopsy two years after suture of the heart in which the left coronary had been tied during repair of the cardiac wound. The territory distal to the site of ligature was thin and dilated.

HENSCHEN, of Zurich, reported favorably upon the strengthening of fusiform aneurisms by the external application of strips of fascia lata according to the method of Halstead and Kirschner.

MURPHY, of Chicago, referred to twenty-three (2,300) hundred establishments of artificial pneumothorax.

ROBINSON, of Boston, advised artificial pneumothorax as a preliminary step to excision in early bronchiectasis.

FRED MURPHY, of St. Louis, advised the employment of local anesthesia wherever possible.

RIXFORD, of San Francisco, called attention to the fact that pneumothorax upon the left side is much more poorly borne than that upon the right.

"Visceral pleurectomy for chronic empyema," by CHARLES MAYO and BECKMAN, of Rochester, Minn. (read by Beckman), was discussed by Ransohoff, of Cincinnati, who pointed out the advantage of numerous longitudinal incisions through the thickened membrane covering the lung. It could be observed that, after each incision, the underlying lung tissue promptly expanded. The more incisions, the more expansion. Similar horizontal incisions resulted in still further expansion of the confined lung. This method was simpler and less tedious than the systematic decortication of the lung.

LUND, of Boston, described a simple and ingenious method of valvular drainage for empyema. A skin flap with its hinge uppermost exposes parts of two ribs. A convenient amount of the upper rib is resected and the pleural cavity is opened in the usual manner. An obliquely cut drainage tube is inserted into the pleural opening and is led downwards to overlie the second rib. Its outer end is cut off obliquely so as to be flush with the chest wall. The lower edge of this tube is firmly attached to the lower margin of the wound by several sutures. The skin flap is now allowed to fall in place and acts as a valve permitting the egress of pus but preventing the ingress of air. Lund states that this method had been used with success in only two or three cases but believes it is worth a trial.

KÜMMELL, of Hamburg, reported a most interesting case of aneurism of the descending thoracic aorta. Generous sections from five ribs (sixth to ninth) on the left side were made. The pleura was separated from the thoracic wall toward the vertebral column with comparative ease, exposing the aneurism and the aorta above and below it. An assistant inserted his hand into the thorax above the aneurism and compressed the beginning of the descending aorta. The aneurismal sac was then split wide open, the clots were cleaned out and it was found that a longitudinal slit several centimeters long communicated with the aorta. This slit was closed by suture and the redundant sac was excised. The patient made an uneventful recovery.

HARTMANN, of Paris, presented experimental evidence showing that the stoma of a gastro-enterostomy, if situated near the cardia will not functionate if the pylorus is open, while if near the pylorus it will functionate even though the pylorus is patent.

FINNEY, of Baltimore, in the discussion, reported a case of total obliteration of the pylorus and almost complete obliteration of the gastro-enterostomy performed five years previously by A. G. Gerster.

GERSTER, of New York, called attention to the fact that the gastro-enterostomy had been made with a Murphy button and that cicatricial contraction of anastomoses made with the button were not infrequent.

MURPHY said that an oval button now in vogue afforded a larger opening.

Third Day.

SPLENECTOMY FOR VARIOUS BLOOD CONDITIONS.

RANZI, of Von Eiselsberg's Clinic in Vienna, reported twenty splenectomies. The three patients operated upon

for hemolytic icterus made excellent recoveries, gaining from seven to twenty-four pounds. Of five cases of pernicious anemia in which the spleen was removed, one died of pneumonia, four improved markedly. Three, previously bed-ridden, could walk again and all gained some weight. Of the nine patients whose spleen had been removed for Banti's disease, seven were quite well. The oldest operation was two years ago. Three other cases were operated upon for splenomegaly following an indefinite type of chronic sepsis. Practically the same report appeared in the last number of the *Zentralblatt für Chirurgie*, 1913, *page* 2004.

FINNEY reported three splenectomies, two for pernicious anemia, one for Banti's disease. All three patients did well.

INTRAVENOUS ANESTHESIA: Report by KÜMMELL, of Hamburg. In 6,000 operations a year intravenous anesthesia was used in 300 selected cases. There were special indications. First, topographic, i. e. in operations upon the head, especially the mouth, tongue and hypophysis. Second, in debilitated patients, especially those suffering from carcinoma, sepsis, shock, or exsanguination. (In a hundred operations for ectopic gestation all were saved.)

With proper technic there should be no fear of local thrombosis or consequent embolism. To avoid local thrombosis there should be a continuous gentle flow of salt solution through the canuls into the veins. The effects of intravenous anesthesia upon the kidneys, lungs and heart are no worse than those of general anesthesia. In Kümmell's Clinic two litres of normal saline solution are administered intravenously after all severe operations.

Technical Details: There is a stand holding three containers, one with normal saline solution, one with 5% ether in normal saline solution and one with isopral. Anesthesia sets in within one and a half to ten minutes after it is begun. As soon as the patient is well under, the administration of the ether solution is stopped, and a gentle stream of salt solution keeps the blood in motion past the canula. In very powerful or in alcoholic patients isopral is employed to initiate the narcoses which is then continued with the ether solution.

Amount of ether used: Eighty-seven grams of ether were used for maintaining anesthesia during resection of the cardia for carcinoma, which took two hours. Three litres of fluid and sixty grammes of ether were used in the operation for aneurism of the descending aorta referred to above. In tuberculous cases the intravenous anesthesia has no disadvantages. The rapid awakening and rarity of vomiting are additional advantages. (Isopral is used in one and one-half per cent. solution.) Veronal is untrustworthy for this purpose. Hedonal is used by the Russians.

E. WYLLIS ANDREWS, of Chicago, employs the intravenous anesthesia for operations of from three to six minutes' duration. He points out that the method has certain limitations. That five per cent. ether solution frequently fails to induce anesthesia and that ten per cent. is dangerous because if its tendency to leaking the blood and to thrombus formation. He believes with Kümmell that its employment is indicated in selected cases.

RADIUM IN MALIGNANT DISEASES. SPARMANN, of Von Eiselsberg's Clinic, in Vienna, reported on forty cases of inoperable malignant disease. The Eiselsberg Clinic owns 225 milligrams of radium and 150 milligrams of mesothorium. Both external and internal applications were made. At first large doses up to 11,000 milligram-hours were employed. Recently these have been reduced to 1,100 to 2,000 milligram-hours.

The hopes entertained at first were not realized. Eleven out of the forty cases only showed improvement and these were in superficially located lesions such as the tongue, the axilla and the skin. In some, recurrence was even hastened by employment of the radium. There is no specific action upon the tumor itself, only a local action.

ABBE, of New York, in the discussion reported employing radium for the past eleven years in over one thousand cases and quoted several cures in superficially located lesions.

Sparmann, in closing, again stated that radium has been beneficial only in superficial lesions and that isolated examples of cures do not furnish sufficient grounds for making any general rules.

FOURTH TRIENNIAL CONGRESS OF THE INTERNATIONAL SURGICAL ASSOCIATION.

New York, April 13th, 14th, 15th, 16th.

President of the Congress, A. DEPAGE, Brussels.

President of the Association, CHARLES WILLEMS, Ghent.

(Next Congress, Paris, September, 1917;
President, WM. W. KEEN, Philadelphia.)

At the opening session addresses of welcome were delivered by Surgeon-General GORGAS, U. S. A., representing the President of the United States, WM. J. MAYO, president of the American Surgical Association, and L. L. MCARTHUR, of Chicago, chairman of the American Committee of the Association, in place of Roswell Park, recently deceased. The address of the president of the Association, Professor WILLEMS, read, in his absence, by the secretary, J. P. HOGNET, of New York, was supplemented by an address of the presiding officer, Professor DEPAGE, also in French.

AMPUTATIONS, the topic of the first scientific session, perhaps suggested by the Balkan wars, were discussed in their various phases by WITZEL, of Bann; BINNIE, of Kansas City; DURAND, of Lyons; RANZI, of Vienna; DEPAGE, STEINTHAL, of Stuttgart; MORESHU, of Paris; PRANKE, of Braunschweig; LORTHIOR, of Brussels; LAMBOTTE, of Antwerp; RITTER, of Posen, and others.

In these papers and discussions, to consider them as a whole, especial attention was given to the means of providing painless, weight-bearing and serviceable stumps, and to the after-treatment. High section of the nerve trunk was emphasized as important by Wilms, and fixation of the nerve on the bone section was also recommended. In the treatment of the end of the bone were discussed the comparative indications of the methods of Bier (osteoperiosteal flap closure) of Wilms (closure by tendon flap) and of Hirsch-Bunge (removal of periosteum and endosteum). Bunge's method was considered best in military practice and in such other cases as cannot expect primary wound-healing. Steinthal showed lantern slides illustrating conical stumps following faulty technics, and painful osteophytes growing from redundant periosteum flaps. Binnie suggested free transplantation of a bone fragment to the end of the long bone as technically simpler than Bier's method. Witzel advocates an "extension overband", i. e. traction upon the dressing covering the stump rather than compression. This is maintained for ten days. Then massage is begun, active movement is made at the end of two weeks and the patient is encouraged to stand upon the stump at the end of three weeks. He should stand on it at the end of four.

The method of Vanghetti, viz., the preparation of loops of tendon covered by and lined with skin, was mentioned as of service in stumps of the upper extremity, to provide attachments for manipulating protheses. Far better than this, however, is the remarkably ingenious Carnes artificial arm, demonstrated by Binnie on three men who had high amputations. One of these men had a stump of humerus scarcely two inches long, yet he, like the other two, by jerking his shoulder in various directions could make his artificial hand and fingers perform astonishingly, e. g., write, pick up a coin, seize and lift a satchel by its handle, pick up a cigarette and lift it to the lips, etc. The demonstration of this remarkable, and mechanically not very complicated, artificial arm was, we think, the most interesting and most impressive feature of the discussion on amputations.

Second Day.

In the symposium upon GASTRIC AND DUODENAL ULCERS, papers were read by DE QUERVAIN, of Basel (by title); HARTMANN, of Paris; LECÉNE, of Paris; W. J. MAYO, and PAYR, of Leipsic. Nothing new was brought out. Hartmann and Lecéne stated that about 20% of callous ulcers

showed carcinomatous degenration and they, as well as Payr, believe that callous ulcers should be excised. Payr holds that of pyloric exclusion methods only von Eiselsberg's can be relied upon. Several of the points made in Mayo's paper were referred to in an editorial in the JOURNAL, April, 1914, page 164.

MURPHY, of Chicago, referred to Rosenow's well-known work on the etiology of gastro-duodenal ulcers, namely, the isolation of strains of streptococci from the depth of gastro-duodenal ulcers in human beings and the experimental reproduction of such ulcers in dogs by the injection of strains of these streptococci.

Third Day.

LEXER, of Jena, read his paper on *"Grafting and Transplantation."* This was easily the best address of the entire meeting.

General Points: As regards free transplantation Lexer stated that the ideal healing required by pathologists was not necessary. If the result was a good functional one, there could be no complaint on the part of the surgeon.

Resorption and substitution should balance one another. At times this did not occur when resorption took place too rapidly.

The technical requisites for success are a healthy transplant and favorable soil. As regards the latter, *absolute hemostasis* is necessary in order to insure contact with the living cells.

The connective tissue derivatives are the only ones suitable for homoplastic transplantation. Heteroplastic transplantations are not good.

As regards the *homoplastic* transplantation of skin, there were no definite conclusions. It had been attempted to accustom the transplanted skin to its new soil by daily injections of the donor's serum under the transplanted flap.

Homoplastic transplants are sooner or later thrown off, either (1) by suppuration or (2) forming a scab which is cast off after a while, or (3), best of all, by scar formation, when the transplant is invaded by connective tissue cells which ultimately take its place. This occurs about the end of the fifth week (i. e., no homoplastic transplant lasts longer than five weeks).

Autotransplantation. The transplantation of *skin* from one part of an individual to another requires no further mention. The transplantation of hairy skin for cosmetic purposes (such as making new eyebrows or a new moustache) has been successfully done. Lexer's lantern slides showed some splendid examples of this.

The *subcutaneous cellular tissue* (epidermisloser Haut) has been proven most useful, especially in plastics of the face, such as the modelling of a new external ear or improving the point of a snub nose.

Mucous membrane has also been successfully transplanted. Examples: blepharoplasty; the substitution of the appendix for part of the urethra (an 8-centimeter defect) which has functionated for the past year without ever having been sounded.

Tendon transplantation. Here early movement is of prime importance. Putting the newly transplanted tendon under tension stimulates regeneration. It regenerates from its own tissues. The skin should be tunnelled, not laid wide open. Lexer showed some remarkable substitutions of the flexor tendon of the fingers. All the work was done from an incision in the palm and one at the tip of the finger. The palmaris longus tendon was used, the end of the profundus was found in the palm and was brought out through the incision in the palm. By tunnelling the skin of the finger the new tendon, attached to the profundus stump in the palm, was led out to the tip of the last phalanx and sutured there. The transplant from the end of the sublimis in the palm was split, led to, and attached to either side of the middle phalanx. A ring worn at the inter-phalangeal articulation served well as an annular ligament, or, an annular ligament could be made by a small transverse plastic of the skin on the flexor aspect of the inter-phalangeal joints.

Fascial Transplantation could be employed anywhere in the body except for closure of defects in the dura or the pleura. Here it should not be used, because of the great connective tissue growth it gives rise to. Example: A boy with cogenital ptosis had the margin of his upper lid attached to the frontalis muscle above the brow.

Fat. In transplants of fat it is important to take a larger piece than seems absolutely necessary because of the subsequent shrinkage. All handling of the fat must be done with the utmost gentleness. Fat is most useful for surrounding tendons or nerves previously adherent after they have been freed (tendo and neurolysis) to prevent subsequent adhesion. Excellent results may be obtained by the implantation of fat between the articular surfaces of those joints which do not bear weight. As to its implantation in the weight-bearing joints, the results are inconclusive at present.

Fat is also excellent for closing defects in the dura, the pericardium and the pleura. The endothelial cells in the fat grow out upon its surface. Lantern slides (Lurniere plates) of fat flaps covering defects of dura were shown. A fat transplant filling the defect in a facial hemiatrophy was also shown.

Vessel transplantation is well known.

Cartilage transplantation: The cartilage should be transplanted together with its perichondrium. Regeneration takes place both from the perichondrium and the center. Homo-transplantation of cartilage is not good. Examples were shown of cartilage transplantation for the fashioning of a new ear in a case of congenital absence of the external ear.

Joint Transplantation. At first the transplantation of one articular surface was tried. It proved so successful that the transplantation of an entire joint was next attempted. Lexer did this for the first time in 1907. The articular surfaces and about one inch of the adjacent bone on either side of the joint were transplanted. The spongiosa of the bone was shown to be absorbed on the X-ray plate and the joint resembled one affected with arthritis deformans. In more recent work the transplant consisted mainly of the cartilaginous articular surfaces with very little underlying bone. There is not more than twenty degrees' motion in any of these transplanted joints. In the knee joint, the two articular surfaces and the crucial ligaments are transplanted. The lateral ligaments are not. The bony ends of the recipient's femur and tibia are barely denuded of their cartilage so that the new cartilaginous coverings accurately fit them.

Lexer spoke of some recent experimental work regarding the adaptation of the host to the transplant. He cited the well known fact that a piece of bone transplanted from one animal (dog) to another (rabbit), if the operation is aseptically done, heals in, becomes encapsulated and lies in a bed of granulation tissue from which it can easily be lifted out. If, on the other hand, the recipient (rabbit) is previously treated with bone extract from the donor (dog) before transplantation is done, and following this, the recipient is injected with the donor's serum from time to time, the bone heals in and shows no tendency to encapsulation or resorbtion. There is intimate contact with the surrounding connective tissue cells and the bone cells seen at the center of the transplanted piece show no degenerative changes. Microscopical sections of bone from control and treated animals several months after transplantation showed striking control.

The lantern slides which Lexer presented showed him to be a plastic surgeon of the very first rank.

In the discussion which followed, Rehn, Lexer's assistant, showed some experimental work with tendons fashioned from subcutaneous connective tissue. The strips of subcutaneous connective tissue are wound around a strand of silk.

On Thursday, April 16th, DR. ALVIN LAMBOTTE, of Antwerp, in the presence of a few surgeons especially interested in bone surgery, plated the fractured femur of a 14-year-old child at the French Hospital. It was a comparatively simple case—a transverse fracture of the middle third of three days' standing.

Lambotte followed the same general principles known in this country as those of "Lane technique." He made a very generous incision upon the outer aspect of the

thigh. The upper fragment's end was readily exposed; this was drawn upward and outward by a bone hook. The end of the lower fragment was then easily exposed. Both fragments were grasped with the Lambotte bone-holding forceps. The limb was then kinked at the site of fracture by an assistant (Dr. Turnure), the ends were exactly coaptated and the limb was straightened out. A third clamp now grasped both fragments at the point of fracture, a plate was introduced into the wound and was accurately applied to the bone. (Lambotte's plates are oval and have a transverse concavity on cross section. This shape gives great strength with comparatively thin material. The screw holes are spaced at one-fourth inch intervals from one end of the plate to the other. The Lane plates of latest pattern also have this feature of multiple holes. The advantage of this is that it permits greater latitude in placing the screws to meet the individual requirements of the case.)

Instead of leaving the center clamp to hold the plate in place, Lambotte then reapplied the two original clamps in such a manner that they held the plate and retracted the soft parts to the upper side of the wound. Holes were drilled and his own type of self-tapping screws were then inserted. Large through-and-through sutures of silk roughly approximated the tissues. The skin margins were united by a running suture. The limb was put up in a retentive dressing (gauze next to the wound, then towels, then a bandage) in such a way that the knee was acutely flexed, the foot almost touching the nates. (Passive and active motions are begun on about the fifth day.) The operation was done with great neatness and celerity but without the slightest hurry. It was eighteen minutes from the incision of the skin to the driving home of the last screw; six minutes more were occupied for closing the wound—twenty-three in all. Every move showed the operator a finished technician.

The operation was so simple that the operator's crutch and lever for overcoming shortening and the plate-holding attachment of his most recent bone-holding forceps were not brought into play.

The versatility of Lambotte is phenomenal. His equipment allows one not only to plate, but also to bolt together the fragments of a comminuted fracture, to encircle and bind together the halves of a long oblique fracture ("cerclage") and to combine any of these methods with any other. He has many more resources at his command than has Lane.

Most of the foreign members of the International Surgical Congress left New York for Philadelphia late on Thursday, the 16th, for a brief tour of the East and Middle West, as follows: Friday, April 17th, was spent in Philadelphia; Saturday, the 18th, in Baltimore; Sunday, the 19th, in Washington. Late Monday, Chicago was reached. Wednesday and Thursday, the 22nd and 23rd, were spent at Rochester, Minn. From there the return journey began. After brief stops at Niagara Falls, Toronto, Montreal and Boston, the visitors reached New York late on Tuesday, the 28th, sailing for Europe the next morning.

Rupture of the Intestine, With Special Reference to Its Early Diagnosis. M. KAHN, Leadville, Colo. *Journal of the American Medical Association,* March 7, 1914.

Maurice Kahn remarks on the high mortality of intestinal rupture and the manner in which it may occur, and reports several cases observed by himself. The necessity of early operation is especially insisted on, as the surgical technic is fairly successful when early operation is performed. There is no better method of insuring the patient's death than masking symptoms by morphin and waiting for the absolute diagnostic signs of the injury. Hence he gives a detailed list of the symptoms. Shock varies from slight to most profound, and its absence signifies nothing. Vomiting is common, but not invariable, and the more persistent it is the more important. It is due to irritation of the peritoneum, which, when sufficient to cause it, may be long delayed, especially if the intestinal content is expelled directly into the pelvis. Obstipation is very common, and is not so useful as a sign as we have it in the picture of traumatic or paralytic ileus. Frequent urination has been observed, but it is rare and a late symptom. Pain is usually intense, local or general, more often the latter. It appears early and continues unabated. The difference in patients enduring pain has to be considered in estimating this symptom. The respiration is said to be characteristic and of thoracic type and shallow. Kahn has not seen this early enough to be of value. If present it will be significant, but its absence means nothing. The pulse, at first, is usually slow and gradually and steadily rises, though exceptionally this is delayed. An increasing pulse-rate is a valuable symptom, but it may be too late. The temperature is but slightly elevated at first and not dependable for early diagnosis. Formerly the facial expression was considered of importance, but generally when it is noticed it is too late to be of value. Loss of liver dullness is also a late sign and may be simulated by a marked meteorism. Abnormal areas of dullness may appear from hemorrhage, but otherwise they would be tardy in appearance; as an early symptom local dullness is not of importance, as there would be other characteristic symptoms accompanying it. Rigidity of abdominal muscles is an invaluable sign in a suspected case and is not subordinate in importance to any other. Local tenderness is of great value if superficial injury can be excluded, and its increase in severity and area are rapid in cases of rupture. The longer the time after the accident and the more numerous and marked the symptoms the surer is the diagnosis and the greater the danger to the patient. Once the diagnosis is made, the importance of prompt action cannot be overemphasized. The history may be misleading, but it is still of primary importance, and with it the persistence of the initial symptoms, especially rigidity and pain, are sufficient at least to warrant an exploratory operation.

Spontaneous Rupture of the Spleen in Typhoid Fever, With a Report of a Case Cured by Operation. (Splenectomy.). L. A. CONNOR and W. A. DOWNES, New York. *American Journal of Medical Sciences,* March, 1914.

The patient, aged 36 years, was admitted to the hospital with what appeared to be a mild typhoid; the only unusual clinical feature was an unusually large spleen, which reached 4 cm. below the costal border. About the ninth day the patient complained of severe pain in the splenic region; this continued for a few days and then gradually subsided. The pain was not attended by any grave clinical phenomena. On the 12th day, following an attack of coughing, the patient was suddenly seized with severe pain in the left hypochondrium and shoulder; the patient's condition became worse, the pulse was rapid and small, the upper left quadrant of the stomach was rigid and tender and there was dullness in the left flank. A diagnosis of rupture of the spleen was made and about five hours after the onset of the symptoms the spleen was removed. A tear in the capsule about three inches in length was found and the abdomen contained about a quart or two of blood. The patient did well and was discharged from the hospital five weeks after operation. An interesting feature of the case is the finding of a laminated clot on the surface of the spleen indicating that a rupture had taken place during the first attack of pain from which the patient had apparently recovered. The subsequent rupture was in all probability due to the attack of coughing. The report concludes with a study of all the previously reported cases of rupture of the spleen during typhoid fever.

An Anatomic and Physiologic Method of Short-Circuiting the Colon. J. R. EASTMAN, Indianapolis. *Journal American Medical Association,* March 17, 1914.

Eastman says that anastomosis of the caput coli at its lowest level with the rectum as a means of short-circuiting the large bowel presents all the advantages and eliminates many of the evils of the operative procedures now in use. Ileosigmoidostomy does not always drain the cecum, and while anastomosis of the terminal ileum with the rectum is somewhat more efficient, the pus formation at the blind end of the ileum, described by Werelius, may defeat the object of the operation and reversed peristalsis favor retention of fermenting food and bacteria. If the caput

coli is anastomosed freely to the rectum at the lowest point possible without traction, the emptying of the cecum is favored at this point, also where direct drainage is most needed. The Murphy button may be used and is here quite safe, as it will be readily discharged here. To insure anastomosis of the most dependent part of the caput coli, the appendix should be removed if it is necessary to secure perfect drainage.

The Treatment of Fracture of the External Malleolus. SIR J. BLAND-SUTTON, London. *Lancet*, February 7, 1914.

Fractures of the external malleolus often lead to impairment of movement of the ankle joint. This is due to the fact that the fracture opens the joint and the subsequent callus formation leads to a chronic inflammation of the joint. Bland-Sutton reports three cases in which he removed the detached malleolus, and obtained a quick convalescence and perfect function in each. The support which the malleolus normally gives the ankle joint is restored by a thick fibrous mass of tissue. This measure carries out a principle of Bland-Sutton's which he has long practiced, namely, the removal of small fragments of the detached bone in fractures involving joints.

A Simple Subcutaneous Cut to Cure "Trigger-Finger" or "Snap-Finger." ROBERT ABBE, New York. *Medical Record*, March 7, 1914.

Abbe explains this condition as due to a crumpling up of the conjoined flexor tendon by a transverse band of fascia situated beneath the distal flexure crease of the palm. In order to cure the condition, Abbe recommends longitudinal incision of the fascia for a distance of about half an inch through the flexure crease. In one case, this simple incision proved efficient.

Periarticular Suppuration of Pure Gonnoccocic Origin. DEWITT STETTIN, New York. *Archives of Internal Medicine*, January, 1914.

A periarticular suppuration of pure gonococcic origin may exist which may simulate an ordinary pyogenic tendosynovitis or cellulitis. It apparently follows an arthritis of the neighboring joint, which in itself may be nonsuppurative. The articular and periarticular lesion may be absolutely distinct anatomically.

The history of a gonorrheal infection, the existence of a urethritis, the previous articular lesions, the absence of an external point of entry for the infection, and the presence of gonococci in the urethral or vaginal secretions may suggest the diagnosis. The certain diagnosis is made by the finding of gonococci, preferably demonstrated by culture, in the purulent exudate.

The condition is subacute and offers a good prognosis if the pus focus is promptly incised and the systemic infection combatted by proper vaccine therapy.

Baur's contentions that in gonorrheal rheumatism, the gonococcus does not live after the sixth day of the disease and that the gonococcus cannot exist in the soft tissues around the joints are both conclusively disproven.

Perimyositis Crepitans. A. E. HOAG and MAX SOLETSKY, New York. *Journal American Medical Association*, March 14, 1914.

A case of perimyositis crepitans is reported by Hoag and Soletsky, who review the three previously reported cases. The patient was a medical student, who had done a great deal of concert piano-playing which caused him a great deal of mental as well as physical strain. For six months he had noticed a crepitation of the muscles in the upper back along the left side and also in the neighborhood of certain joints. The pain was felt only on exertion. Röentgenoscopy revealed no calcification or anomalies in the joints. Crepitation was felt by placing the hand over the scapular muscles and having the patient put them on the stretch. This was also felt over the vertebral muscles and the angle and wrist joints. An examination of muscle sample showed localized thickening in the aponeurosis and muscle caused by hyaline swellings. The case seems to be the only one in which microscopic and pathologic examinations were made. Hoag and Soletsky conclude as follows: "The cause of this lesion is overexertion resulting in small areas of rupture in the muscle and the aponeurosis, which are followed by minute hemorrhages and then hyaline thickenings. These thickenings cause a creaking when the two surfaces rub together. If there is any fibrin present it is absorbed very early."

Observations on Acute Hemic Infections of the Kidney. G. E. BREWER, New York. *The American Journal of Urology*, December, 1913.

This paper, one of the opening addresses at the recently held International Congress of Medicine, is largely a résumé of Brewer's previous contributions to the subject. He finds close analogy to the difficulty in inducing experimental ascending nephritis in his clinical experience. "Even in septic conditions of the lower urinary passages the concomitant renal lesion may be of hematogenous origin." During the progress of any acute infectious disease many of the bacteria that enter the blood current are excreted through the kidneys. No demonstrable lesion results if they are few in number, their virulence low, and the kidneys healthy. If one of these three elements is lacking, typical lesions are produced. They may result in a rapidly fatal symptom—complex or in a slower evolution of one of the types of renal suppuration. Though the disease is often bilateral it is frequently unilateral, in the kidney that has a diminished resistance to infection. This may depend upon previous disease, calculus, hydronephrosis, hyperemia, etc.

A Practical Method for Determining the Amount of Blood Passing Over During Direct Transfusion. E. LIBMANN and R. OTTENBERG, New York. *Journal American Medical Association*, March 7, 1914.

The importance of an accurate method of estimating the amount being transfused in blood transfusion is pointed out by Libmann and Ottenberg. It is of importance from two points of view: (1) in order to avoid any danger to the donor from loss of blood; (2) to determine when the patient has received enough for the desired therapeutic effect. From previous studies they have found that variations in blood or pulse-rate are too irregular to be of use, but the rise in percentage of hemoglobin when the patient's hemoglobin is low, is susceptible of pretty accurate measurement. If two fluids having different percentages in solution are mixed in unequal volumes, the percentage strength of the resulting mixture is the sum of the products of volume multiplied by the percentage of each solution, divided by the volume of the total mixture. In order to calculate the exact amount of blood and not merely the relative volume transfused, it is necessary to know the blood volume of donor and patient. Great accuracy in this is at present impossible, but a large number of experimental observations by various authors have shown that blood volume bears a rather constant relation. It has recently become clear that the original estimate of Welcker, that human blood-weight is approximately one-thirteenth of the body-weight, is wrong, and that the actual blood volume is more nearly one-nineteenth of the body-weight. The authors' observations and experience indicate that if more than one-quarter of the donor's blood is taken, symptoms of collapse, ordinarily of short duration, are apt to supervene. The donor should be sharply watched as soon as the hemoglobin rise in the patient nears a point that indicates that nearly one-quarter of his blood has been transfused. Warnings in the literature as to danger of acute dilatation of the patient's heart from excessive transfusion led the authors at first to make a similar calculation as to the amount of blood a given patient could receive. Experience, however, has taught them that such calculation is necessary only when there is a disparity in size between the donor and patient. Usually the circulation adjusts itself rapidly to the increased blood-supply. There are several possible sources of error mentioned. The first, of course, is due to loss of blood in acute hemorrhage. When the hemorrhage is recent enough to permit an opinion as to the amount lost, allowance can be made for this. But when the loss has occurred from twelve to twenty-four hours before the transfusion, it is probably unnecessary to make the allowance. Another source of error which is present in practically every case and for which it is impossible to make an allowance, is the absorption of plasma from the circulation by the tis-

sues. The authors' experiments, however, when accurate weighings of donor and patients were made, showed that while these sources or error may exist, in most cases they are not large enough to affect materially the results of the calculation. They say in conclusion: "1. It is as necessary to control the amount of blood transferred during a direct transfusion as it is to control the dosage in any other therapeutic procedure. 2. A simple arithmetical formula is given by which it is possible to calculate how much rise in the percentage of hemoglobin will be obtained by transfusion of a given volume of blood. The formula is:

"[(Patient's blood-weight × patient's hemoglobin per cent)] + (Weight of blood transfused × donor's hemoglobin per cent)] divided by [Patient's blood-weight + weight transfused (in pounds)] = hemoglobin per cent reached.

"The patient's blood-weight is estimated as one-nineteenth of the body-weight. 3. The amount to be transfused may be decided arbitrarily, with regard to the patient's need, or with regard to the donor's ability to give up blood. 4. It is always safe to take one-fourth of the donor's blood; it is often safe to take as much as one-third of the donor's blood volume, provided the transfusion is not done too rapidly. 5. Though the danger of overloading the circulatory system of the patient is not as great as has been thought, yet probably it is not wise to add more than one-fourth, or at most one-third, as much blood as a person of the patient's weight normally has. This needs to be taken into account only in children or very small adults, transfused from large donors, because in most cases a single donor will collapse before he can give enough blood to embarrass the circulation of a full-grown adult patient. If more than one donor is used, this part of the circulation becomes of great importance. 6. By means of exact weighings of either donor or patient, or both, before and after transfusion, in a series of eleven cases, we have shown that the formula which they give corresponds quite closely to the actual amount of blood transfused. 7. By using this calculation as a guide and determining before each transfusion the point to which the hemoglobin ought to be raised, it is possible to avoid untoward symptoms in either the donor or patient. We have demonstrated this in a large number of transfusions."

A Study of the Pathology of the Thyroids From Cases of Toxic Non-Exophthalmic Goiter. LOUIS B. WILSON, Rochester, Minn. *The Journal-Lancet,* February 15, 1914.

The pathology of the thyroid in true exophthalmic goiter is essentially a primary parenchymatous hypertrophy and hyperplasia, *i. e.,* an increased amount of functionating parenchyma associated with an increased absorption. The process is an acute one. The pathology of atoxic simple goiter is marked essentially by atrophic parenchyma, decreased function and decreased absorption. The process is a chronic one. The pathology of those cases of toxic goiter that resemble exophthalmic goiter is one of increased parenchyma through regenerative processes in atrophic parenchyma, or the formation of new parenchyma of the fetal type with an increase in each instance of secretory activity and of absorption. The nearer the cases of this type approach in age and symptoms true exophthalmic goiter, the shorter the duration of the period of goiter before operation, and the smaller the average weight of the gland at the time of its removal.

The cases of toxic goiter in which the symptoms are of the cardiovascular variety much more closely resemble cases of simple goiter in their pathology. A larger number of them is of the colloid type; the enlargement of the thyroid has existed for a longer period before operation, and the portion of the gland removed is materially larger than in the cases resembling the exophthalmic variety. All the above pathologic evidence points to a constant relative association of increased secretion and increased absorption from the thyroid, proportional to the degree of intoxication of the patient.

A Consideration of Our General Anesthetic Agents, Ether and Nitrous-Oxide-Oxygen. WILLIAM C. WOOLSEY, Brooklyn, N. Y. *Long Island Medical Journal,* February, 1914.

Only ether and nitrous oxide are considered since these are the anesthetics of choice.

Operative surgical shock may be etiologically divided into (a) that caused by anesthesia, toxemia direct and indirect, (b) that caused by hemorrhage or similar serious coincident factors of operative invasion, (c) that caused by the actual afferent nerve trauma of surgical procedure. If the second group be omitted, the author believes that 90 per cent of operative shock cases are really anesthetic shock. Many of these cases are due to faulty administration of the anesthetic. The commonest error is that of not permitting sufficient oxidation of the blood during administration of ether. Cyanosis ought not to be present; if it is, it points to obstruction of the entrance of air, at the base of the tongue, at the glottis, at the lips or finally in the trachea, where mucus or vomitus has collected.

The author believes that the question of dosage is much simplified by the use of the anesthetometer, especially in institutions where comparatively inexperienced men are frequently being broken in as anesthetists.

Nitrous oxide and oxygen becomes a proper agent for general surgical narcosis only when it is utilized in one of two ways: (a) as an adjunct to complete local analgesia where only its most superficial effects are necessary, while the local anesthetic cuts off wholly the field of operation, or (b) where it is skillfully supplemented by enough ether to bridge over the more severely traumatic stages of the operation.

Roentgen Stereography in the Diagnosis of Urinary Calculi. E. W. CALDWELL and H. M. IMBODEN, New York City. *New York State Journal of Medicine,* March, 1914.

1. The only disadvantages of stereography of the urinary tract as compared with the ordinary single plate method examination are the increased technical difficulties and the greater expense. Accuracy in these examinations is of such great importance as to justify the increase in expense and in labor necessary for the stereoscopic method.

2. Stereography reduces to a minimum the errors from the following sources:

(a) Artifacts in the plates resembling stone which may appear in one plate but not in two in the same place.

(b) The mistaking of extra-urinary bodies for calculi.

(c) Overlooking the shadows of calculi which are superimposed on bone shadows, especially the heavy stones of the pelvis.

(d) The knowledge of depth and perspective which these stereoscopic examinations present gives confidence in the estimation of the size, outline and position of the kidneys.

Blenorrheic Processes, Especially in the Vagina of Children, Caused by the Diphtheria Bacillus. E. KOBRAK, Berlin. *Medizinische Klinik,* March 8, 1914.

The author describes several cases of inflammation of the throat in which only a severe catarrhal condition, without the presence of membrane, was observed, in which, however, culture showed diphtheria bacilli. These cases responded to antitoxin treatment. He then reports two cases of marked vaginal discharge in little girls in which examination of smears failed to show gonococci, but in which cultures showed profuse growth of diphtheria bacilli. Owing to the fact that these cases also quickly responded to treatment by antitoxin, the author believes that this type of vaginal infection in children should be looked for more often.

The Abderhalden Ferment Reaction in Carcinoma. (*Ueber die Abderhaldensche Fermentreaktion bei Karcinom.*) G. M. FASIANI, Turin. *Wiener Klinische Wochenschrift,* March 12, 1914.

Fasiani tested 64 serums. The reaction was positive in 95 per cent of the cancer patients and in 65 per cent of cancer-free patients. In four cases of sarcoma the reaction was negative. In view of these findings, the author concludes that the reaction is of little value.